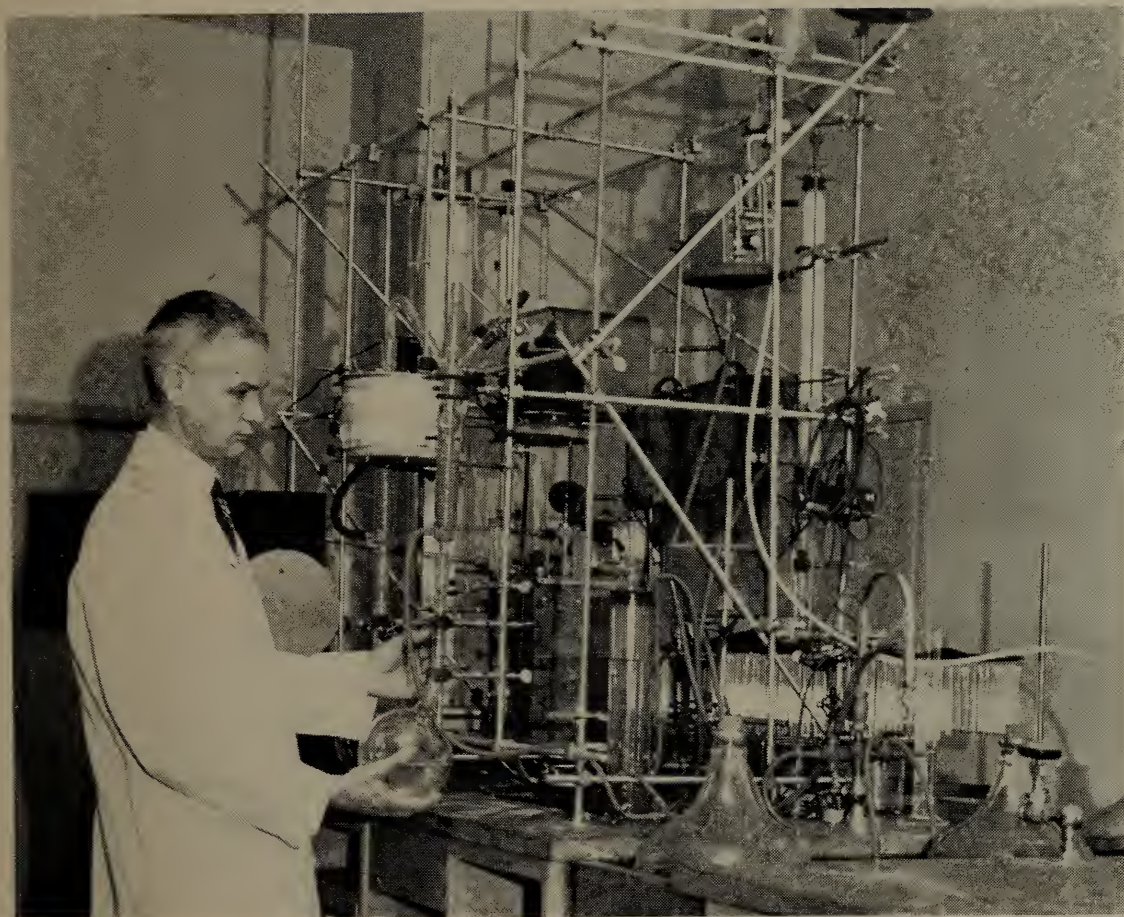


NEW BEDFORD INSTITUTE OF TECHNOLOGY

BULLETIN 1959-1961

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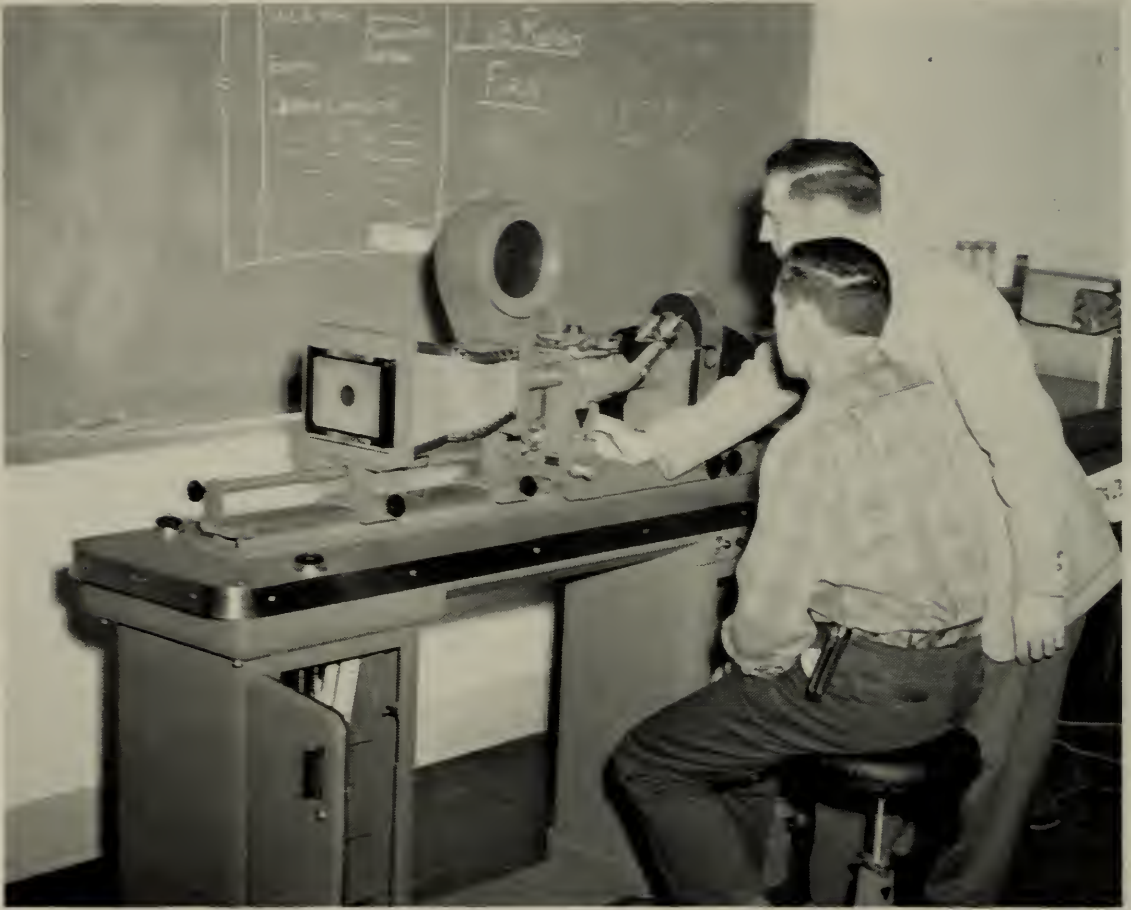
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Chemical Research



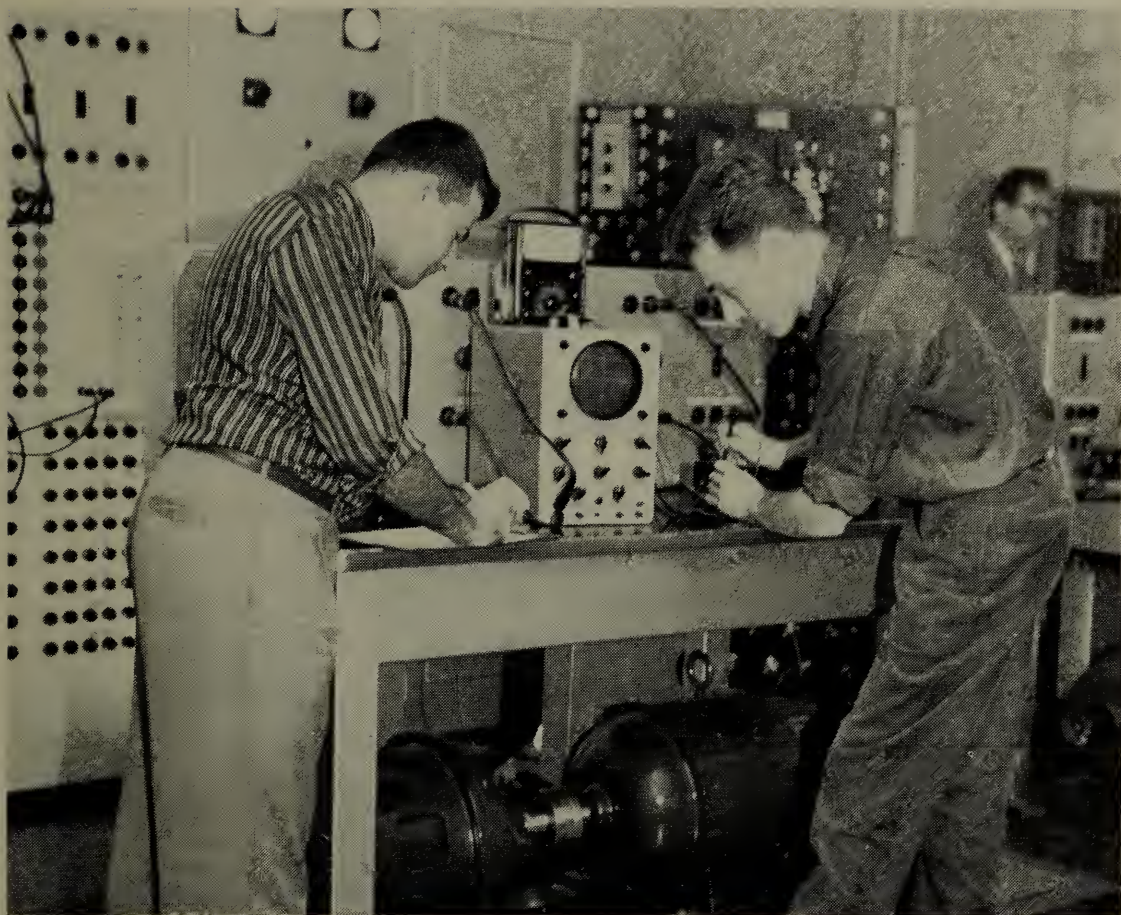
Textile Engineering



Metallurgy Laboratory



Lecture Room



Electrical Engineering Laboratory



Bookstore



Textile Design and Fashion



Chemistry

NEW BEDFORD INSTITUTE OF TECHNOLOGY

Technology Center - New Bedford, Mass.



COEDUCATIONAL

**BULLETIN FOR THE
ACADEMIC YEARS**

1959-1961

FOREWORD

The purpose of this issue of the Bulletin is to provide information for prospective students, or anyone else who may be interested, regarding the history, traditions, objectives, resources, programs, equipment and staff of the Institute.

NEW BEDFORD INSTITUTE OF TECHNOLOGY

Calendar of Events

ACADEMIC YEAR

1959 - 1960

Year 1959

SEPTEMBER

- 9, 10—Wednesday & Thursday, 8:00 A.M. Freshman Registration
- 11—Friday, 9:00 A.M. Freshman Orientation
- 11—Friday, 8:00 A.M. Upper Classmen Registration
- 15—Tuesday, 8:00 A.M. First Semester Begins
- 28 to October 2, Monday through Friday Freshman—Class Elections

OCTOBER

- 12—Monday Columbus Day—Holiday

NOVEMBER

- 11—Wednesday Veterans' Day—Holiday
- 25—Wednesday, 11:50 A.M. Thanksgiving Recess Begins
- 30—Monday, 8:00 A.M. Thanksgiving Recess Ends

DECEMBER

- 18—Friday, 3:50 P.M. Christmas Recess Begins

Year 1960

JANUARY

- 4—Monday, 8:00 A.M. Christmas Recess Ends
- 18—Monday, 9:00 A.M. Mid-Year Examinations Begin
- 27, 28—Wednesday through Thursday . Registration—Second Semester
- 29—Friday, 4:00 P.M. Mid-Year Examinations End

FEBRUARY

- 1—Monday, 8:00 A.M. Second Semester Begins
- 22—Monday Washington's Birthday—Holiday

APRIL

- 1—Friday, 3:50 P.M. Spring Recess Begins
- 11—Monday, 8:00 A.M. Spring Recess Ends
- 15—Good Friday No Classes
- 19—Tuesday Patriots' Day—Holiday

MAY

- 9 to 13 Monday through Friday Upper Classmen Elections
- 23—Monday, 9:00 A.M. Final Examinations Begin
- 30—Monday Memorial Day—Holiday

JUNE

- 3—Friday, 4:00 P.M. Final Examinations End
- 5—Sunday Commencement and President's Reception

ACADEMIC YEAR**1960 - 1961****Year 1960****SEPTEMBER**

- 7, 8—Wed. through Thurs. 8:00 A.M. Freshman Registration
 9—Friday, 9:00 A.M. Freshman Orientation
 9—Friday, 8:00 A.M. Upper Classmen Registration
 13—Tuesday, 8:00 A.M. First Semester Begins
 26 to 30 Monday through Friday . . . Freshman—Class Elections

OCTOBER

- 12—Wednesday Columbus Day—Holiday

NOVEMBER

- 11—Friday Veterans' Day—Holiday
 23—Wednesday, 11:50 A.M. Thanksgiving Recess Begins
 28—Monday, 8:00 A.M. Thanksgiving Recess Ends

DECEMBER

- 16—Friday, 3:50 P.M. Christmas Recess Begins

Year 1961**JANUARY**

- 2—Monday, 8:00 A.M. Christmas Recess Ends
 16—Monday, 9:00 A.M. Mid-Year Examinations Begin
 25, 26—Wednesday through Thursday . Registration—Second Semester
 27—Friday, 4:00 P.M. Mid-Year Examinations Ends
 30—Monday, 8:00 A.M. Second Semester Begins

FEBRUARY

- 22—Wednesday Washington's Birthday—Holiday

MARCH

- 30—Thursday, 3:50 P.M. Spring Recess Begins

APRIL

- 10—Monday, 8:00 A.M. Spring Recess Ends
 19—Wednesday Patriots' Day—Holiday

MAY

- 8 to 12 Monday through Friday . . . Upper Classmen Elections
 22—Monday, 9:00 A.M. Final Examinations Begin
 30—Tuesday Memorial Day—Holiday

JUNE

- 2—Friday, 4:00 P.M. Final Examinations End
 4—Sunday Commencement and President's Reception

NEW BEDFORD INSTITUTE OF TECHNOLOGY

Directory of Personnel

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Ex-Officio

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HON. FRANCIS J. LAWLER, *Mayor, Municipal Bldg.*
MISS RUTH B. MCFADDEN, *Superintendent of Schools, 166 Wil-
liams St.*

Term Expires 1959

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WILLIAM E. KING, 415 County St., New Bedford, Mass., Supervisor,
Department of Education, Rehabilitation Division, Duff
Building, New Bedford, Mass.
JOHN VERTENTE, JR., 67 Mechanics Lane, New Bedford, Mass. In-
ternational Representative United Textile Workers of
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CLARENCE G. BOWMAN, 310 Hemlock St., New Bedford, Mass.,
Trucking and Rigging, New Bedford, Mass.
JOSEPH DAWSON, JR., 15 Elm St., So. Dartmouth, Mass., Knowles
Loom Reed Works, Inc., P. O. Box 589, New Bedford, Mass.

Term Expires 1960

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GEORGE E. CARIGNAN, 386 Union St., New Bedford, Mass., Director
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Workers Union of America, 888 Purchase St., New Bed-
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MRS. LYDIA B. NUNES, 261 Union St., New Bedford, Mass., At-
torney
JOSEPH M. SOUZA, 25 Junior St., New Bedford, Mass., Probation
Officer, Third District Court, New Bedford, Mass.

Term Expires 1961

JOSEPH A. DANCEWICZ, 12 Locust St., New Bedford, Mass.

NILS V. NELSON, 8 Temple Ave., Winthrop, Mass., Office, N. V.
Nelson Co., Cotton, 157 Federal St., Boston

MILTON GOLLIS, 567 Rockdale Ave., New Bedford, Mass., Partner,
Gollis Men's Apparel, 562 Pleasant St., New Bedford, Mass.

MRS. BEATRICE THOMAS, 63 Summer St., Fairhaven, Mass.

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Instructor

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Instructor

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Visiting Professor

MILTON E. PARKER, B.S.CH.

Visiting Professor

Department of Electrical Engineering

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Instructor

JOHN F. WAREING

Instructor

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Instructor

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Instructor

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Assistant Professor

Department of Social Sciences

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Professor in Charge of Department

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Professor in Charge of Department

Division of Textile Design and Fashion

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Assistant Professor

EVELYN RAMALHETE, B.S.T.D.F.
Instructor

ROBERT C. BOOTH
Instructor

Division of Textile Engineering

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Associate Professor

EDWARD H. CLOUTIER
Associate Professor

FRANK HOLDEN
Associate Professor

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Assistant Professor

JOHN T. REGAN, A.B.
Assistant Professor

ANTONE RODIL
Assistant Professor

WILLIAM A. SILVEIRA, B.S.T.E., M.S.T.T.
Assistant Professor

ARTHUR V. SWAYE, B.S.T.E.
Assistant Professor

EDWARD S. RUDNICK, B.S.M.E., M.S.T.T.
Visiting Lecturer

NEW BEDFORD INSTITUTE OF TECHNOLOGY

General Information

THE COLLEGE

Aims

The Institute of Technology is a college which prepares selected young men and women for careers in science, engineering and business. It seeks to obtain as students well-rounded young people who have achieved respectable academic records in high school and proved themselves as interested, good school citizens. The Institute feels that if such a student applies himself to the task he can meet the Institute's academic standards successfully. Although the training offered at the Institute is related primarily to scientific and industrial problems, the college recognizes that, especially today, an ever-increasing proportion of the administrators of industry is drawn from technical professions. For this reason the Institute has included in its curricula a number of courses related to human nature and relations. The Institute, therefore, by setting standards of performance which require that the student master both theory and application, and by setting up courses to stimulate a student's interest in personal and industrial problems, seeks as its goal a well-rounded personality.

The effectiveness of this educational approach is indicated by the readiness with which the seniors at the Institute find good positions at graduation. In recent years many of its graduates find themselves holding positions of trust and responsibility as members of industrial management.

History

The Institute of Technology, one of the most modern and best-equipped institutes of its kind in the world, was established and incorporated by the Board of Trustees on August 1, 1895, under Chapter 475 of the Acts of 1895 of the Commonwealth of Massachusetts.

The first meeting of the Board of Trustees was held on January 27, 1896 and committees were appointed to supervise activities with relation to building finance, machinery, education and other necessary executive functions. During the year 1897 the city of New Bedford appropriated \$25,000 for the use of the school and the Commonwealth of Massachusetts appropriated an additional \$25,000 the following year. With these funds the first of the present buildings was constructed.

Since its founding the Institute has attempted to organize and conduct programs in technology which will equip the student to cope

successfully with problems relative to industrial development, manufacturing and research. It has been its policy to provide, consistently, instruction in both the theory and practice in all phases of dyeing, manufacturing and distribution of textiles.

In addition to its program in textile education, the Institute has over the years introduced programs in technology relative to industrial areas other than textile manufacturing. These include courses of instruction in chemistry, textile chemistry, textile design and fashion, mechanical engineering, electrical engineering and business administration.

The New Bedford Institute of Technology is proud of its professional standing and of the recognition it receives throughout the world. This recognition is evidenced by the representatives of various countries who have enrolled at the Institute. This representation as for the most part include students from Mexico, Israel, Ecuador, Salvador, Korea, Pakistan, Philippines, France, Chile, Bolivia, Canada, Formosa, Haiti, Brazil, Greece, Iraq and Turkey.

Environment

The Institute is situated in the city of New Bedford, Massachusetts, a city with a population of over 100,000 people. It is located along the main bus line; both the bus terminal and railroad stations are within walking distance.

New Bedford, an industrial city, is an especially suitable location for a technical college. For many years it was recognized as the whaling city of the world, and later as the world's largest manufacturer of fine cotton yarns and fabrics. Today New Bedford is a city of many diversified industries; these industries include the manufacture and/or processing of rubber products, electronic equipment, machine tools, screws and facets as well as textiles. This historic city is still recognized as a leading fishing port. Each year, millions of dollars worth of fish are brought into this port, either for direct shipment or for New Bedford's large fish processing houses.

These industries, both old and new, afford the Institute many opportunities for planned inspection trips. This, we feel, is an invaluable aid in acquainting the student with the practical phases of his academic work.

Students wishing to remain in New Bedford during the summer recess will find many opportunities to work during this period. Because of the nature of the city's industry, the student often finds work which is in his chosen field, thereby gaining practical experience as well as financial aid to meet the expenses incurred during the school year.

The civic center of New Bedford is a few minutes walk from the school grounds. Here the student will find the municipal building, the main library, veterans administration building and many other city and county buildings. Close to the civic center he will find the city's largest shopping and theater district.

Status

The New Bedford Institute of Technology is accredited by the Collegiate Board of Authority of the Commonwealth of Massachusetts. This authority grants a Bachelor of Science degree to graduates who have successfully completed the prescribed courses. The Collegiate Board of Authority has also granted permission to confer the Master of Science degree in Textile Technology and Textile Chemistry.

The Honorary Doctorial and Master of Science degrees are awarded to those whose outstanding achievements in the respective fields are recognized.

The Institute is approved for the education of veterans under P. L. 550, 87th Congress and P. L. 894, 81st Congress.

The Institute is approved by the offices of the Attorney General for the admission of alien students.

The Institute also plays a prominent roll in the National Council of Textile Education. Students' chapters at the Institute are sponsored by the American Institute of Electrical Engineers, American Association of Textile Chemists and Colorists, and the American Association of Textile Technologists.

Buildings and Equipment

Art and Library Building. This was the first building erected on the present campus by the Commonwealth of Massachusetts. Completed in 1889, this three-story building now houses all art studios, the microscopy and photo-microscopy laboratories, the warp preparation laboratory, the Bookstore, and a student office for the Institute's newspaper "Tech Talk."

Each of the art studios is equipped with drawing tables, stools, easels, tabourets and reference material to provide the student with those training facilities needed for the successful study of design, drawing and painting.

The microscopy and photo-microscopy laboratories are used in conjunction with courses relating to the quantitative and qualitative study of the composition of textile and other related materials. These laboratories are equipped with a wide range of microscopes, cameras, and supplementary instruments used by the students in obtaining experimental data.

Winding, warping and slashing equipment for both the cotton and synthetic systems are available for student use and demonstration in the warp preparation laboratory.

Textile Engineering Building. This structure was erected in 1902 by the Commonwealth of Massachusetts as an addition to the Art and Library building, and, in 1905, was enlarged to provide an additional 20,000 square feet of floor space for textile manufacturing equipment.

The complete line of manufacturing equipment housed in this building enables the student to learn the mechanics and capabilities of

the individual machines in processing any fibers whether natural or man-made, into yarn and woven or knitted fabrics of various types.

Instruments and physical testing machines necessary for the training of students in the determination of all fiber yarn and fabric appearance and strength characteristics can be found in the testing laboratory.

Chemistry and Engineering Building. Completed in 1911, this separate structure houses the main chemistry, the tool manufacturing, the engineering drawing and machine tool, the electronics, the dyeing and finishing and the biological laboratories; it also houses the library, modern lecture rooms and a pilot plant for chemical research.

All chemical, engineering and electronic laboratories provide the student with the necessary equipment to perform practical experiments or projects in order to correlate class theory with practical and experimental proof.

A complete line of full scale commercial dyeing and finishing machinery make the Dyeing and Finishing laboratory one of the best equipped of any college. Full scale dyeing and finishing of cotton, rayon, nylon, dacron and wool piece goods, as well as yarn dyeing, is conducted by students.

Engineering and Science Building. The most recent building on campus was completed in the spring of 1956, and comprises the major portion of the Institute's expansion program for more adequate classroom and laboratory facilities. This structure supplements the present facilities of the college with modern engineering, science and research laboratories. These include mechanical engineering, electrical engineering, physics, physical chemistry and microbiology laboratories. In addition, it houses all administrative offices, additional classrooms, an amphitheater and a modern gymnasium.

The most modern equipment has been acquired and installed within the various laboratories. The electrical engineering laboratory, for instance, contains ten motor-generator sets including three units especially designed for dynamometer tests, and two control panels with associated control equipment. Voltage up to 250 volts D.C. can be distributed to all other laboratories in the building by a central control system.

The laboratory facilities in the Mechanical Engineering Department make possible the verification of classroom theory; the observation and measurement of variations in the characteristics of materials under controlled conditions; and the range and scope of the more common materials and machines in use today.

The newly constructed physics, physical chemistry and microbiology laboratories are equipped with the most modern instrumentation to be found in any college of comparable size in New England.

Future Expansion

A ten year \$6,000,000 expansion program has recently been approved by the Board of Trustees of the Institute. This program includes construction of a research and graduate school, a student union building,

a library, an arts and science building and an administration building. Such an expansion will allow the Institute to increase its present enrollment of 550 students to nearly 1,100 students.

Plans are now being completed to add a new auditorium to the present Engineering and Science building.

ADMISSION PROCEDURES

Matriculation in any of the undergraduate curricula offered by the Institute is governed by the following procedure and requirements. (Admission requirements and procedures for graduate study are listed under the Graduate School section of this bulletin page 60.)

Each applicant must:

Obtain an application blank which contains Form A and Form B.

Submit Form A with application fee to the Institute.

Submit Form B to High School Guidance Director.

Make application to take the Scholastic Aptitude Test of the College Entrance Examination Board—the applicant is responsible for having the test scores sent to the Institute.*

Arrange a personal interview with the Director of Admission—preferably accompanied by a parent or guardian.

Submit a physical report by family physician.

(Each applicant will be notified directly by the Director of Admission as to the date of interview and the submission of his physical report.)

General Requirements

The entrance requirements are intended to assist in selecting from among the many candidates for admission, those best qualified to take advantage of the educational opportunities at the Institute.

The general requirements pertaining to all curricula are:

The satisfactory completion of a four year high school curriculum or its equivalent, yielding 16 units of secondary school work. A unit is the equivalent of at least four recitations a week for a school year.

The primary basis for admissions is the student's standing in his high school graduation class. All applicants are required to take the Scholastic Aptitude Test of the College Entrance Examination Board, preferably no later than March of the senior high school year.

Refer to page 16 for further information on the Scholastic Aptitude Test.

Requirements for the Bachelor of Science degree**Business Administration:**

| | |
|----------------------------|---------|
| Required subjects, 7 units | |
| English | 4 units |
| Algebra | 1 unit |
| U. S. History | 1 unit |
| Science | 1 unit |

An applicant may meet these requirements if he has been graduated from a high school curriculum other than the College Preparatory program; however, it is required that he show an aptitude for business and related subjects and complete his secondary school curriculum with high scholastic standing.

Chemistry or Textile Chemistry:

| | |
|----------------------------|---------|
| Required subjects, 9 units | |
| English | 4 units |
| Algebra | 2 units |
| Plane Geometry | 1 unit |
| U. S. History | 1 unit |
| Chemistry | 1 unit |

Electrical, Mechanical or Textile Engineering:

| | |
|--|---------|
| Required subjects, 9 units | |
| English | 4 units |
| Algebra | 2 units |
| Plane Geometry | 1 unit |
| U. S. History | 1 unit |
| Physics or Chemistry (including lab) | 1 unit |

Textile Design and Fashion:

| | |
|----------------------------|---------|
| Required subjects, 6 units | |
| English | 4 units |
| U. S. History | 1 unit |
| Science | 1 unit |

Textile Technology:

| | |
|----------------------------|---------|
| Required subjects, 8 units | |
| English | 4 units |
| Algebra | 1 unit |
| Plane Geometry | 1 unit |

| | |
|--|--------|
| U. S. History | 1 unit |
| Physics or Chemistry (including lab) | 1 unit |

Since each applicant is considered individually, the Director of Admissions may make exception in unusual cases to any of the requirements.

Advanced Standing

Undergraduates of other recognized colleges who apply for admission to New Bedford Institute of Technology as transfer students with advanced standing must present an official statement of honorable dismissal, a transcript of college record and a marked copy of the college's catalog to describe courses completed and offered for transfer credit. Only those courses will be accepted which fit the curriculum requirements of the Institute, and for which the earned grade was "C" or better.

Scholastic Aptitude Test Information

The Scholastic Aptitude Test of the College Entrance Examination Board is required in order that the Director of Admissions may better evaluate the student's ability to succeed at the collegiate level.

| Date of Tests | | Place |
|------------------|------------------|---------------------------|
| 1959-1960 | 1960-1961 | (Nearest to New Bedford) |
| December 5, 1959 | December 3, 1960 | New Bedford High School |
| January 9, 1960 | January 14, 1961 | New Bedford High School |
| February 6, 1960 | February 4, 1961 | New Bedford High School |
| March 12, 1960 | March 18, 1961 | New Bedford High School |
| May 21, 1960 | May 20, 1961 | New Bedford High School |
| August 10, 1960 | August 9, 1961 | Brown Univ., Prov., R. I. |

Candidates should make application by mail to the College Examination Board, P. O. Box 592, Princeton, New Jersey. When ordering forms, applicants must state whether they wish applications for December, January, February, March, May or August test. Applications must be made early enough to allow sufficient time for scheduling of each test. Each application submitted for registration must be accompanied by the examination fee of \$7.00

Applications received within three weeks of December, February and August testing dates and within four weeks of the January, March and May testing dates will be subject to a penalty fee of \$3.00 for late registration.

Applications received at Princeton within two weeks of each testing date cannot be guaranteed acceptance.

The Board will report the results of the test to the colleges indicated on the candidates' application. Candidates do not receive a report of their test scores directly from the Board.

STUDENT EXPENSES

Tuition and General Fees

Tuition for all courses varies according to the residential status of the student. For residents of Massachusetts, the rate is two hundred dollars per year (\$200.00); for resident of other States, the fee is two hundred and fifty dollars (\$250.00). The rate for all foreign students is five hundred dollars (\$500.00).

All prospective students must pay a fee of \$10.00 when submitting their application for admittance. This fee (non-returnable) may be applied toward tuition in the event of matriculation.

LABORATORY AND SPECIAL FEES (for one academic year)

| | |
|---|---------|
| Athletics | \$15.00 |
| Student Activities | 10.00 |
| General Laboratory fees for all students | 10.00 |
| General Laboratory fee for 2nd, 3rd, and 4th year Chemistry major students | 20.00 |
| Chemical fee (additional fee for all out-of-state and foreign students) | 10.00 |
| Graduation fee—all seniors | 10.00 |
| Registration fee (non-returnable) but applied to tuition in the event of matriculation | 15.00 |
| Registration fee (foreign students) (non-return- able) but applied to tuition in the event of matriculation | 50.00 |
| Late registration fee | 5.00 |
| Books and supplies—Freshmen (estimated) | 150.00 |
| Books and supplies—Upperclassmen (estimated) .. | 100.00 |
| Library fee | 5.00 |

Refunds

Any student withdrawing during the first six weeks of the semester is eligible to receive a refund according to the following schedule:

| Requests | Refunds |
|---------------------------|---------|
| Less than one week | 100% |
| Less than two weeks | 80% |
| Between two and six weeks | 40% |
| After six weeks | 0% |

STUDENT REGULATIONS

Conduct

It is assumed that students matriculating in any one of the various programs offered by the Institute have attained sufficient maturity and developed those attributes conducive to an adequate preparation for professional careers. This means that the administration at the Institute expects that each student will have developed an ability to get along well with others and to maintain a personal high standard of honesty and moral conduct. The Institute has not established any rigid rules restricting the conduct of individuals or groups of students. However, it will be understood that a student may be dropped from the rolls or subjected to other disciplinary action, for conduct which is illegal, immoral, or not in keeping with the best interest of the Institute.

Attendance

Every student is expected to be present at all lectures and laboratories for which he is registered, unless a satisfactory excuse can be presented for his absence. Excessive absence will result in disciplinary action which may lead to loss of credit for a course, suspension or dismissal.

Withdrawals

No freshman will be permitted to withdraw from a course.

An upperclassman may be permitted to withdraw from a course, without penalty, only during the first six weeks of the semester. Withdrawals without permission or after the first six-week period will be recorded as failures. To withdraw from a course without penalty a student must:

notify his faculty advisor of his intention.

receive permission from the Dean of Students to withdraw from a course.

Any student withdrawing from the Institute must first consult with the Business Office. Failure to do so will prevent the Institute from giving the student a certificate of honorable dismissal.

A deficiency resulting from failure may be removed by:

repeating the course the next time it may be re-scheduled, or securing transfer credit in a comparable course from some other accredited institution. Only grades of "C" or better are accepted for transfer credit. Such courses for transfer must be approved in advance by the Dean of Students. When a subject which has been failed is repeated at the Institute, the new grade is entered on the student's record in addition to the original grade.

Eligibility

No student placed on the probation status is eligible to participate in athletics or hold an elective office in non-athletic activities.

GRADING AND DEGREES**Grading System**

The following grading system shall be used:

A—Excellent (90 and above)

B—Good (80-89)

C—Average (70-79)

D—Passing without credit points (60-69)

F—Failure (below 60)

I—Incomplete—A grade of incomplete may be assigned by the instructor when a legitimate reason exists for the failure to complete the work on the date required. This grade indicates credit is withheld without prejudice to the student's rating pending completion of the required work. A grade of "I" must be removed within 30 academic calendar days after the completion of the course.

Credits and Averages

Beginning with the class entering in September of 1959, the following Quality Point System will go into effect.

The student's semester quality point rating is a weighted value used to denote his relative standing. The point values assigned are A = 4 points, B = 3 points, C = 2 points, D = 1 point and F = 0 points. These point values, when multiplied by the credit hours assigned to the subject and added together, are divided by the sum of the credit hours to give the student's semester rating. The cumulative rating for more than one semester will be obtained in the same manner as the computation for the rating of a single semester.

Classes which entered the Institute prior to September of 1959, will continue with the current system, that is, A = 3 points, B = 2 points, C = 1 point, D = 0 points and F = 0 points.

Dean's List

A student who, at the end of a semester, has a high scholastic standing will be placed on the Dean's list. This list will be posted on the official bulletin boards.

Degrees with Distinction

Students completing graduation requirements with exceptionally high scholastic records are graduated with distinction; that is, with distinction, with "high" distinction, or with "highest" distinction.

GRADUATION REQUIREMENTS

The requirements for graduation are the satisfactory completion of all courses in one of the prescribed curricula of the Institute, with a total of credit points not less than the minimum number of credit hours required in the individual curriculum.

STUDENT FACILITIES AND SERVICES

Library

The Institute's library is under the supervision of a full-time librarian and contains approximately 9,000 volumes covering the fields of textile design and technology, chemistry, engineering, business administration and socio-humanistic studies. By gift or subscription the library receives 203 publications issued periodically, including magazines, journals and publications of professional societies and industrial organizations.

The library, which is housed on the third floor of the Chemistry and Engineering building, comprises a stock room, a reading room and a work room. Expansion plans call for a library building capable of housing a minimum of 30,000 volumes. The library is open from 9:00 A.M. to 4:00 P.M., Monday through Friday and from 7:00 P.M. to 9:00 P.M., three nights a week. Professional reference assistance is available thirty hours a week.

The Institute has established inter-library loan privilege with the New Bedford Free Public Library and can borrow freely from its book collection of 265,000 volumes. In addition, the facilities of this large municipal library are available without cost to all students at the Institute whether or not they are residents of New Bedford.

Bookstore

The Institute's bookstore is located on the first floor of the Art and Library building. Here the student will find all the approved books and supplies for all courses offered by the Institute.

Students, although not required to purchase materials from the bookstore, are advised not to buy elsewhere without first obtaining approval from their instructors.

All proceeds from the bookstore, after operating costs have been met, are used to provide student services at the Institute.

Housing

Dormitory facilities are not provided by the Institute. For non-residents, however, excellent accommodations with private families living within walking distance of the Institute are readily available. A list of approved rooms is maintained and arrangements may be made through the Institute to secure suitable living quarters. Accommodations for fraternal brothers of Phi Psi and Delta Kappa Phi are available at their respective fraternity houses.

Lounges

Two lounges are maintained for student use; one is located in the Art and Library building, and the other, in the Engineering and Science building.

Both lounges are suitably furnished with chairs, tables, television sets, and refreshment dispensers. The lounges are used by all students for relaxation and for social contact with one another.

Guidance and Counseling

Because the Institute is a small college, a close personal relationship is maintained between the student body and the faculty. Through the Dean of Students and the Faculty Advisors, assistance is given to students during the year in the scheduling of their classes and in solving problems which may arise during the year. Whenever it is deemed necessary, correspondence and interviews are entered into between the Dean of Students and families of those students whose performance is not considered satisfactory.

The freshman year begins with a Freshman Orientation Period immediately preceding the Fall Term. Registration, general intelligence and aptitude tests are completed, orientation lectures on campus and professional life are given. Interpretive results of the intelligence and aptitude tests are available to the students, to the Dean of Students, and to the faculty advisors to aid in the making of decisions throughout the student's college career.

An average of one and one-half hours of preparation for each hour of lecture or recitation will be required of freshmen.

Each student's performance is evaluated four times during the academic year; that is, his scholastic standing is obtained at the end of the first eight weeks and at the end of each semester. This procedure is followed in order to allow the administration to inform the student of his standing and advise him more effectively as to the need for remedial action should such action be required.

Psychological Services

A counseling service is provided by the school for students with problems of personal adjustment. Such students may be referred to this service by faculty members, advisors, or others on the college staff, or they may seek consultation directly.

Placement

A Student Placement Service is maintained at the Institute on a full-time basis. The main purpose of this office is to aid and assist the graduating students to secure positions in their chosen fields of endeavor. This office keeps abreast of the needs of the various industries and passes this information along to the graduates.

The Placement Officer arranges for all on-campus interviews and helps both the visiting officials and the students to get the most out of

such on-campus interviews. The graduate can also find many application forms for employment with various concerns in the Placement Office. Also he is allowed to utilize many of the College Directories and Placement Annuals which list possible employment offers that are housed in the College Placement Office at Tech.

The U. S. Government listings are also posted weekly and many of Tech's graduates have gone into one of the many departments of government work. The government also has employed many of our students for summer-time work in their various fields and this information is also passed on to the underclassmen.

The Placement Service is not a guarantee of employment but it does serve the graduate toward successfully positioning himself. In addition to student placement the service is also extended to Alumni members who are desiring a change of position or re-location. The Placement Office handles all requests for experienced personnel through the Alumni membership.

ENDOWMENTS AND SCHOLARSHIPS

The New Bedford Institute of Technology offers a number of scholarships made possible through private and industrial endowments.

A number of tuition scholarship awards are available to upperclassmen and a limited number are available to prospective freshmen.

All scholarship awards are made on the recommendation of the faculty committee of the Institute or a committee appointed by the donors of the various scholarships. All applications for scholarship consideration should be made directly to the Dean of Students.

The following tuition scholarships are available to upperclassmen.

William Firth Scholarship. A one-hundred-dollar tuition scholarship made available from the William Firth Memorial Fund. Available to students in all courses.

The Manning Emery, Jr. Scholarship. A one-hundred-dollar tuition scholarship made available from the Manning Emery, Jr. Memorial Fund. Available to students in all courses.

The Neuss Hesslein and Company Scholarship. Two one-hundred-dollar tuition scholarships made available from the Neuss Hesslein and Company Scholarship Fund. Available to textile students only.

Aerovox Scholarships. Two-hundred-dollar annual awards to students in mechanical or electrical engineering or chemistry. Preference will be given to close relatives of Aerovox employees.

Acushnet Process Scholarships. Two one-hundred-dollar tuition scholarships to students in mechanical or electrical engineering or chemistry. Available to residents of greater New Bedford and preference will be given to close relatives of Acushnet Process employees.

Berkshire-Hathaway Inc. Scholarships. Two annual awards of \$125.00 to students in textiles who have indicated an interest in pursuing their textile careers in New England.

Morse Twist Drill Scholarships. Two one-hundred-dollar tuition scholarships to students in mechanical or electrical engineering or chemistry. Preference to alumni or active members of Junior Achievement.

Barnet D. Gordon Family Foundation Scholarship. A one-hundred-dollar tuition scholarship in textiles.

Revere Copper and Brass Scholarships. Two one-hundred-dollar tuition scholarships to students in mechanical or electrical engineering or chemistry.

Sea Plant Chemical Works, Inc. Scholarship. A one-hundred-dollar tuition scholarship available to a student in chemistry.

Jacques Wolf & Company Scholarship. A one-hundred-dollar tuition scholarship to a student in textiles.

J. C. Rhodes Scholarship. A four-year tuition scholarship each year to students in mechanical or electrical engineering or chemistry.

Sandoz Chemical Scholarship. A one-hundred-dollar tuition scholarship to a student in textiles.

Everett H. Hinckley Scholarship. A one-hundred-dollar tuition scholarship made available by the New York Chapter of the New Bedford Institute of Technology Alumni Association to a freshman going into his sophomore year. It is offered in memory of Everett H. Hinckley, former head of the Institute's Chemistry Department.

Chemstrand Corporation Scholarship. Two two-hundred-and-fifty dollar tuition scholarships are awarded each year to students in Textile Engineering or Textile Technology curricula.

Under an ordinance of the City of New Bedford, five four-year tuition scholarships are awarded each year to graduates of the New Bedford High School, Holy Family High School, Vocational High School and St. Anthony High School. These are distributed as follows: two to graduates of New Bedford High School, one to a graduate of each of the other schools.

Several other scholarships are available under the auspices of the Scholarship Fund of the New Bedford Institute of Technology.

STUDENT AWARDS

The following awards are made annually:

Northern Textile Association Medal. The Northern Textile Association offers a medal, to be awarded each year to the student in the Textile Engineering graduating class who shows the greatest proficiency in scholarship. This is determined by an examination of all students

records and the medal is awarded to that student having the highest average according to the credit point system of determining averages.

The competition for this medal is also open to all evening students who have completed the full course of study required for a degree in Textile Engineering. The association offering the medal has made it a condition of the award that at least four members of the graduating class be eligible to the competition.

Everett H. Hinckley Scholarship Award. This is an annual award of 100 dollars made by the New York Chapter of the New Bedford Institute of Technology Alumni Association. It is offered in memory of Everett H. Hinckley, former head of the Institute's Chemistry Department.

The William E. Hatch Award. This award is made to the member of the freshman class of Textile Engineering, who has the highest credit point average for the year. It is awarded by the Alumni Association of the Institute, to commemorate the day of William E. Hatch's retirement from the presidency of the Institute. This award is sponsored by the Alumni Association.

The Morris H. Crompton Award. This award is made to the student of the graduating class of Mechanical Engineering, who has the highest four-year average according to the credit point system of determining averages. It is awarded in honor of Morris H. Crompton, former head of the Department of Engineering. This award is sponsored by the Alumni Association.

The Fred E. Busby Award. This award is made by the Alumni Association to the student of the graduating class of chemistry, who has attained the highest four-year average according to the credit point system. It is presented in honor of Fred E. Busby, former head of the Department of Chemistry.

The American Association of Textile Chemists and Colorists Award. This award is presented annually to the outstanding senior in the Textile Chemistry Course. The award is in a form of a book.

The Samuel Holt Designing Award. This award is sponsored by the Alumni Association. Presentation is made, annually, to a graduating student in recognition of excellence in Textile Designing. The award is made as an expression of appreciation and grateful acknowledgement on the part of the Alumni in Mr. Holt's honor. Mr. Samuel Holt, former head of the Designing Department retired from the faculty in 1938. He is respectfully remembered by all who studied under him for his kindness, patience, understanding and ever-willing desire to assist the individual student just a little bit more.

The American Association of Textile Technologist Award. The basic objective of the American Association of Textile Technologists is to encourage in the broadest and most liberal manner the advancement

of textile technology. The furtherance of this objective is certain progress by the Association's encouragement in the field of textile education.

In order to fulfill this objective, the American Association of Textile Technologists is presenting the plaque to an outstanding student, who has been selected by the faculty of the New Bedford Institute of Technology as that member of the graduating class who as an undergraduate has shown outstanding achievement in scholarship, technical ability, industry, judgment, leadership, reliability and ability to work and cooperate with others.

The Phi Psi Award. The Phi Psi Award is a beautiful pocket-book and leather case set made of ostrich leather and lined with calfskin. Each article is embossed with the coat of arms of the fraternity, also the recipient's name in gold. In addition, he is presented with a suitably engraved certificate, certifying the honor that has been given him. This award is presented, regardless of fraternity affiliations to the outstanding graduating student on the basis of his scholastic standing which includes analytical powers, accuracy and reliability. In addition he must be possessed with leadership, initiative and personality.

The Delta Kappa Phi Award. The Delta Chapter of the Delta Kappa Phi Fraternity, the oldest professional textile fraternity in the world, sponsors this award. This trophy and its accompanying certificate is awarded annually to the member of the graduating class who, in the opinion of the selection committee, has done the most for New Bedford Institute of Technology in athletics during his four years here. His qualities of leadership, sportsmanship and fair play are all considered.

The Kappa Sigma Phi Award. This award is given annually by the Kappa Sigma Phi Sorority, to the graduating female student who, in the opinion of the members of this sorority is outstanding in scholastic achievement, leadership, initiative and personality.

Honorable Samuel Ross Memorial Medal. This medal is presented to the outstanding sophomore student taking the Textile Engineering or Textile Technology curriculum. It is awarded by the Alumni Association of the Institute in honor of Samuel Ross co-founder of the Institute and for many years Chairman of the Board of Trustees. This award is sponsored by the Alumni Association.

Arthur W. Forbes Award. Arthur W. Forbes award was established in memory of the late Arthur W. Forbes, President of the J. C. Rhodes Company. This award consists of two monetary prizes of \$75.00 and \$25.00 to be given annually on Class Day to the two members of the senior class submitting papers evidencing high standards in technical report writing.

Textile Veterans Association Award. This award is presented by the Textile Veterans Association to the outstanding veteran in the graduating class majoring in a textile course. His standing is determined

by an examination of all students records. His qualities of leadership, sportsmanship and fair play are all considered.

Design and Fashion Award. A citation of excellence presented annually to a graduate who has majored in Textile Design and Fashion. This award is sponsored by the Alumni Association.

Electrical Engineering Award. A citation of excellence presented annually to a graduate who has majored in the Electrical Engineering Course. This award is sponsored by the Alumni Association.

Mathematics Achievement Award. This award, a book of standard mathematical tables, is sponsored annually by the Chemical Rubber Company and presented to a member of the freshman class for excellence in freshman mathematics.

Physics Achievement Award. The current edition of the **HANDBOOK OF CHEMISTRY AND PHYSICS** is awarded to the engineering major achieving the highest standing in physics. This prize is presented annually by the Chemical Rubber Company.

STUDENT ORGANIZATIONS

The following organizations are available at the Institute for student participation:

Camera Club

An organization for all students interested in photography as a hobby. A well-equipped darkroom is available for processing and the application of most photographic techniques. Color processing equipment is being added as rapidly as possible. Many of the photo illustrations for the student publications and the yearbook are handled by the Camera Club.

Circle K Club

This organization is sponsored by Kiwanis International. It is a service organization similar to Kiwanis and other service clubs. It serves at the college level. It is a character building group which offers service on the campus, to the school and to the community.

College Glee Club

For all students interested in music, a Glee Club has been organized. The Glee Club is supported by the Student Council. The purpose of the Club is to furnish both a musical and social outlet to its members, who meet weekly with a capable director, preparing a repertoire of songs for different functions during the school year.

Fabricator

The Fabricator is the College Yearbook published by and for all students at the Institute. This Yearbook provides for the most part a pictorial record of all classes and of all principal events of the school year.

Fraternal Societies

The Institute has three national, professional, and social men's fraternities. These are Phi Psi, Delta Kappa Phi, and Nu Beta Tau. Kappa Sigma Phi is the only women's sorority at the Institute. These organizations all play a major role in the social and athletic affairs of the Institute and are governed to some extent by the Interfraternity Council.

The Interfraternity Council consists of members from each fraternal organization and an advisor chosen from the faculty. This body determines the rules governing rushing and the scheduling of events; it also enforces all Institute rules regarding membership in fraternities.

Professional Societies

American Association of Textile Chemists and Colorists. This chapter is a student unit of the national organization whose student membership is open to students who are preparing for a career in the application of dyes or chemicals in the textile industry, in the manufacture and research of these products, or in the testing of textile materials. It holds regular meetings of its own, and participates in the activities of the regional section (The Rhode Island Section) of the parent organization.

American Institute of Electrical Engineers. This student branch was established February 2, 1956. The objective of the A.I.E.E. student affiliate is to provide an organization through which the technical development and ideas of the engineering profession outside the classroom may be shared with the students and to provide the student with the opportunity to contribute also. Any engineering student registered in a four-year course is eligible for membership.

Mechanical Engineering Club. This organization is available to students in the Sophomore, Junior and Senior classes majoring in Mechanical Engineering. The purpose of this group is to develop in the student a better concept of industries' problems, and the benefits of affiliation with professional engineering societies. This is accomplished by sponsoring technical sessions, arranging plant tours, attending joint meetings with professional societies, and holding dinner meetings with industrial representatives as invited guests.

American Association of Textile Technologists. The purpose of this organization is to bring about a more intimate relationship between the textile industry and undergraduates majoring in the field of textiles or related areas.

Religious Groups

Newman Club. The Newman Club is an organization of Catholic college students dedicated to the wider application of the teachings of the Catholic Faith to their private and social lives. The Club has a chaplain to minister to the spiritual needs of the members. This organization is affiliated with the National Federation of Newman Clubs.

Protestant Club. This is an organization of Protestant college students whose purpose is to instill in its members a greater appreciation and need for applying to their lives the precepts of the Protestant Faith.

Student Council

This is a body of elected representatives from each of the four classes, and one faculty representative. Its purpose is to study problems of the student body, class activities, and the various matters of student organization. The council represents the student body in proposing changes or making recommendations to the college authorities.

Tech Talk

Tech Talk is the official student publication on campus. It is managed and published solely by student effort. A faculty member is appointed by the administration to act as an advisor to the group. This publication appears monthly and it is supported in greater part by a portion of the student's activities fee. The purpose of this publication is to make available to the student body a channel for expression and information.

ATHLETICS

The New Bedford Institute of Technology, its administration and faculty, approve and encourage a full program of intercollegiate and intramural athletics providing that such activities do not interfere with academic responsibilities. The Athletic Council plans and provides for the fullest possible program of intraclass and intrafraternity sports. This organization, composed of representatives of both the Board of Trustees and the faculty, also determines athletic policies, budgets for each sport and approval of all sport schedules.

Varsity teams include baseball, basketball, tennis and soccer. The Institute schedules for its games most of the recognized colleges within its athletic class. The Institute is an active member of the National Association of Intercollegiate Athletics and of the Southern New England Coastal Conference. Membership of the Southern New England Coastal Conference comprises, in addition to "Tech," Stonehill College, Quinnipiac College, Bridgewater State Teachers College, Bradford Durfee College of Technology, Babson Institute, and the Massachusetts Maritime Academy.

OFFICE OF PUBLIC RELATIONS

The Office of Public Relations at the New Bedford Institute of Technology is under the Direction of Mr. James A. Flanagan. This office handles all of the publicity material for the school and makes regular releases to newspapers and radio stations. A system of intra-college communication also is maintained for the benefit of students and faculty.

Through its releases and various publications and brochures the Office of Public Relations endeavors to further the aims of the college in every possible way, to create a better understanding of the Institute and higher education in general, to keep the public informed of worthwhile college activities and of individual and group accomplishments, to acquaint prospective students with the college and to assist in their orientation upon enrollment and to further the Institute's reputation as a good neighbor and as an essential part of the community.

In addition to regular news from the college, the Office of Public Relations handles all of the sports news of the four varsity athletic teams. Three brochures are prepared annually and sent to dozens of news agencies throughout the state and country. This office works in conjunction with the newspaper and radio stations to keep the community informed of the different college sports attractions that are presented throughout the year.

Close working contact is maintained with the many student organizations in the college in order that they may receive the proper amount of publicity and that their efforts may be well coordinated. Through this office also, the Tech Alumni is kept fully informed by means of a monthly newsletter of the developments and advances of their Alma Mater.

RESEARCH FOUNDATION

The Massachusetts State Legislature in May, 1957, authorized the establishment of the New Bedford Institute of Technology Research Foundation. This Research Foundation is a recognition of the excellent facilities and personnel available at the Institute to aid private industry and governmental organizations in the fields of textiles, chemistry and engineering.

The aims of the Foundation are to cooperate with the above-mentioned organizations and to aid them by conducting research, development and consulting programs. The Foundation also serves to further the knowledge of its research staff and to utilize this knowledge, both practically and theoretically, in meeting successfully the aims and objectives of the Foundation.

During the past ten years, chemical and biological research on fish and fish by-products has been confined to the manufacture of fish meal and fish solubles, the manufacture of fish hydrolysates, the nutritive values of fish and shell fish, and methods of deodorizing fish process-

ing plants. For the past three years research on the pilot plant production of fish hydrolysates for animal feeding has been conducted in cooperation with the Department of Food Technology of the Illinois Institute of Technology.

Other recent research projects include:

Quartermaster Research and Development Command, U. S. Army.

Study of commercial soil resistant finishes.

Field dry cleaning compounds for soil resistant fabrics.

Knitting Army mufflers to government specifications.

Dyeing of nylon twill with specialized dyestuffs.

Industrial Research Projects

The development of a waterproof window package box for cranberries.

The Fungicidal properties of paper, Mylar film and winding cement.

The use of "Biostat," a broad spectrum antibiotic, for extending the freshness of fish.

Manufacturing of various yarns and fabrics requiring certain properties not available in market type fabrics for purposes of dyeing and finishing research problems.

Weaving of synthetic yarns into terry towels for the client's further research toward the practical use of such material.

ALUMNI ASSOCIATION

The Alumni Association of the New Bedford Institute of Technology has a twofold purpose: In its social aspect it serves to continue and renew the friendships and feelings of comradeship which all alumni felt as students; from a service viewpoint it aids the administration of the Institute by bringing to its attention those curricula omissions and/or changes which would up-grade the standards of its graduates; the association serves the alumni as a focal point for placements; it serves as a clearinghouse for news about, and of interest to, the alumni; it helps the Institute in those cases where alumni financial aid can be of the utmost assistance; and it furnishes both the administration of the Institute and all alumni a common and unifying point of contact.

All who have spent a minimum of the equivalent of one academic year at the New Bedford Institute of Technology are considered alumni of the Institute.

The Alumni Association maintains an up-to-date file of all graduates. Each month during the academic year every alumnus receives a News-Letter that brings him the latest information about the Institute and the activities of the alumni. At the end of May each year, the Alumni Association has an Alumni Reunion Weekend to which alumni come from far and near to renew acquaintances and see at firsthand the progress being made at Tech.

Further information can be obtained by contacting James F. Flanagan '47, Secretary, at the New Bedford Institute of Technology.

NEW BEDFORD INSTITUTE OF TECHNOLOGY

Undergraduate Courses of Study

Eight undergraduate curricula leading to the Bachelor of Science degree are offered by the Institute. These curricula are:

Business Administration

Chemistry

Electrical Engineering

Mechanical Engineering

Textile Chemistry

Textile Design and Fashion

Textile Engineering

Textile Technology

The curricula which are outlined in the following pages have been arranged according to fields of interest, i.e.—business administration, chemistry, engineering and textiles. Curricula are under constant study and are subject to change whenever the Institute feels that such change will benefit both student and industry.

BUSINESS ADMINISTRATION

Economic productivity and progress are dependent to a considerable extent upon sound and effective business management. As industry and our economy expand, education for business at the collegiate level becomes more significant. Collegiate instruction in business administration, according to the American Council on Education, is now being offered in more than five hundred institutions of higher learning in the United States. A recent report of the United States Office of Education stated, "Collegiate education for business has had one of the fastest—if not the fastest—growths of any of the areas of higher education and today constitutes an important and significant part of collegiate instruction."

In recognition of these facts, the Board of Trustees at the Institute voted in 1958 to add to the curricula a complete program in Business Administration. The program was inaugurated with a freshman class of seventy students in September of that year. The Massachusetts Board of Collegiate Authority has approved this new curriculum and the award of the degree of Bachelor of Science in Business Administration to all students who complete the four years of prescribed study.

The Business Administration curriculum offered at the Institute reflects the increasing awareness in industry of the fact that merely technically-trained personnel are not adequate to meet the changing needs of world economy. It recognizes that the ultimate aim of education is to produce an intellectually and emotionally mature person with a sound sense of values as well as competence in technical skills. Consequently, the new curriculum incorporates the standard adopted by the American Association of Collegiate Schools of Business that at least forty per cent of the total hours required for the Bachelor's degree must be in the area of general or liberal arts education and at least forty per cent in the area of business administration. Its specific objective will be in the education of students to their fullest potential for competence in business and effectiveness in civic life.

This course of study is planned to aid students in preparing for positions of responsibility in business. During the first two years fundamental courses in English, mathematics, accounting, social science, a foreign language, and basic courses in economics are required. After completion of the sophomore year, students are permitted a choice of three major fields for study in their junior and senior years: Accounting, Marketing or Management. At this point, aptitude and ability of the student, as well as his interest in subject matter of the curriculum, are re-examined with his advisers for the purpose of providing proper guidance in the selection of his major field, a matter of primary importance.

Accounting

The need for personnel trained in the skillful application of accounting principles has become increasingly apparent in all lines of industry and business. The accurate interpretation of financial reports

and the necessity for efficiency as well as competence in record keeping for business are considered of paramount importance to business management. Accounting is often considered the "backbone" of management. Public, private, institutional, and government accounting present almost unlimited opportunities for the practice of the skilled accountant. Opportunities for women as well as men are rapidly increasing. Also to be considered is the fact that an accountant is frequently in a favorable position to move up to executive or managerial responsibilities as the result of his background knowledge and experience.

The accounting major program at the Institute includes, in addition to the required general education subjects, courses in statistics, business law, cost accounting, auditing, taxes, and principles of management.

Marketing

The sale and distribution of the products of industry and the many public and private services necessary to the economic life and progress everywhere provide a great many people with absorbing and lucrative vocations. Trained personnel in these fields may progress faster and further than those who have not had the opportunity for study at the collegiate level.

The marketing program provides specialized training in the technicalities of buying as well as selling, with courses in retail store management and modern wholesaling. Market research, government regulation of business, taxation, insurance, and personnel administration are included in addition to the required core curriculum.

Management

The course of study here is aimed to assist the young man or woman who is interested in preparing to assume responsibilities in business that may lead to junior executive or management positions. The possibility of proprietorship interest in his own or his family's business is also considered. Study in the management major should facilitate advancement toward top executive positions following some years of business experience. This program of study includes fundamental courses in accounting, business law, principles of management, labor relations, personnel administration, government regulation of business, effective speaking and seminars in the problems of business.

In each of the three major areas, provision may be made for electives in other departments at the Institute for students who indicate special interests and aptitudes. Such elective courses may be arranged by the student in consultation with his faculty adviser and with the Department Heads concerned.

Business Administration Program**FRESHMAN YEAR***First Semester*

| | | |
|--------|---------------------------------------|------------|
| E 101 | English Composition | 3 - 0 - 3† |
| M 121 | Business Math I | 3 - 0 - 3 |
| BA 101 | Accounting Principles | 3 - 2 - 4 |
| BA 103 | Survey of Business Practices | 2 - 0 - 2 |
| SS 110 | General Psychology | 2 - 0 - 2 |
| SS 131 | Economic History of the United States | 3 - 0 - 3 |

Total 16 - 2 -17

Second Semester

| | | |
|--------|------------------------------|-----------|
| E 102 | English Composition | 3 - 0 - 3 |
| M 122 | Business Math II | 3 - 0 - 3 |
| BA 102 | Accounting Principles | 3 - 2 - 4 |
| BA 104 | Survey of Business Practices | 2 - 0 - 2 |
| SS 120 | Government | 2 - 0 - 2 |
| SS 132 | Economic Geography | 3 - 0 - 3 |

Total 16- 2 -17

SOPHOMORE YEAR*First Semester*

| | | |
|--------|-----------------------------------|-----------|
| BA 201 | Intermediate Accounting | 3 - 0 - 3 |
| BA 206 | Marketing Principles | 3 - 0 - 3 |
| BA 209 | Business Communications | 2 - 0 - 2 |
| SS 230 | Principles of Economics | 3 - 0 - 3 |
| SS 221 | History of Western Civilization I | 3 - 0 - 3 |
| L 201 | French I* | |
| or | or | 3 - 0 - 3 |
| L 211 | German I* | |

Total 17 - 0 -17

Second Semester

| | | |
|--------|------------------------------------|-----------|
| BA 202 | Advanced Accounting | 3 - 0 - 3 |
| BA 207 | Marketing Principles | 3 - 0 - 3 |
| BA 210 | Business Communications | 2 - 0 - 2 |
| SS 231 | Economic Analysis and Problems | 3 - 0 - 3 |
| SS 222 | History of Western Civilization II | 3 - 0 - 3 |
| L 202 | French II | |
| or | or | 3 - 0 - 3 |
| L 212 | German II | |

Total 17 - 0 -17

† Refer to page 67 for an explanation of course coding systems.

* A student has the option of choosing for two years a language course in either French or German.

JUNIOR YEAR—ACCOUNTING MAJOR

First Semester

| | | |
|--------|----------------------------------|-------------|
| BA 301 | Cost Accounting | 3 - 0 - 3 |
| BA 303 | Business Law | 3 - 0 - 3 |
| M 100A | Introductory Mathematics | 3 - 0 - 3 |
| E 301 | Masterpieces of World Literature | 3 - 0 - 3 |
| CH 381 | General Biological Science | 2 - 0 - 2 |
| L 301 | French III | 3 - 0 - 3 |
| or | or | |
| L 313 | German III | |
| Total | | 17 - 0 - 17 |

Second Semester

| | | |
|--------|-------------------------------|-------------|
| BA 302 | Cost Accounting | 3 - 0 - 3 |
| BA 304 | Business Law | 3 - 0 - 3 |
| M 100B | Introductory Mathematics | 3 - 0 - 3 |
| E 302 | Survey of American Literature | 3 - 0 - 3 |
| SS 340 | Sociology | 2 - 0 - 2 |
| L 302 | French IV | 3 - 0 - 3 |
| or | or | |
| L 314 | German IV | |
| Total | | 17 - 0 - 17 |

SENIOR YEAR—ACCOUNTING MAJOR

First Semester

| | | |
|--------|--------------------------|-------------|
| BA 401 | Auditing | 3 - 0 - 3 |
| BA 403 | Income Tax Accounting | 3 - 0 - 3 |
| BA 406 | Insurance Fundamentals | 2 - 0 - 2 |
| E 401 | Technical Report Writing | 2 - 0 - 2 |
| M 221 | Statistics I | 3 - 0 - 3 |
| BA 405 | Personnel Administration | 3 - 0 - 3 |
| Total | | 16 - 0 - 16 |

Second Semester

| | | |
|--------|--------------------------------------|-------------|
| BA 402 | Auditing | 3 - 0 - 3 |
| BA 404 | Income Tax Accounting | 3 - 0 - 3 |
| BA 407 | Seminar in Current Business Problems | 2 - 0 - 2 |
| E 402 | Effective Speaking | 2 - 0 - 2 |
| M 222 | Statistics II | 3 - 0 - 3 |
| SS 412 | Applied Psychology | 3 - 0 - 3 |
| Total | | 16 - 0 - 16 |

JUNIOR YEAR—MARKETING MAJOR

First Semester

| | | |
|--------|----------------------------------|-------------|
| BA 305 | Advertising and Selling | 3 - 0 - 3 |
| TE 310 | Materials and Fabrics | 3 - 0 - 3 |
| BA 303 | Business Law | 3 - 0 - 3 |
| E 301 | Masterpieces of World Literature | 3 - 0 - 3 |
| CH 381 | General Biological Science | 2 - 0 - 2 |
| L 301 | French III | 3 - 0 - 3 |
| or | or | |
| L 313 | German III | |
| Total | | 17 - 0 - 17 |

Second Semester

| | | |
|--------|-------------------------------|-------------|
| BA 306 | Retail Store Management | 3 - 0 - 3 |
| BA 308 | Modern Wholesaling | 3 - 0 - 3 |
| BA 304 | Business Law | 3 - 0 - 3 |
| E 302 | Survey of American Literature | 3 - 0 - 3 |
| SS 340 | Sociology | 2 - 0 - 2 |
| L 302 | French IV | 3 - 0 - 3 |
| or | or | |
| L 314 | German IV | |
| Total | | 17 - 0 - 17 |

SENIOR YEAR—MARKETING MAJOR

First Semester

| | | |
|--------|--------------------------|-------------|
| BA 408 | Market Research | 3 - 0 - 3 |
| BA 410 | Taxation | 3 - 0 - 3 |
| BA 406 | Insurance Fundamentals | 2 - 0 - 2 |
| E 401 | Technical Report Writing | 2 - 0 - 2 |
| BA 405 | Personnel Administration | 3 - 0 - 3 |
| SS 450 | Labor Relations | 3 - 0 - 3 |
| Total | | 16 - 0 - 16 |

Second Semester

| | | |
|--------|--------------------------------------|-------------|
| BA 409 | Market Research | 3 - 0 - 3 |
| BA 411 | Government Regulation of Business | 3 - 0 - 3 |
| BA 407 | Seminar in Current Business Problems | 2 - 0 - 2 |
| E 402 | Effective Speaking | 2 - 0 - 2 |
| SS 412 | Applied Psychology | 3 - 0 - 3 |
| SS 451 | Labor Relations | 3 - 0 - 3 |
| Total | | 16 - 0 - 16 |

JUNIOR YEAR—MANAGEMENT MAJOR

First Semester

| | | |
|--------|----------------------------------|-----------|
| BA 301 | Cost Accounting | 3 - 0 - 3 |
| BA 309 | Management Principles | 3 - 0 - 3 |
| BA 303 | Business Law | 3 - 0 - 3 |
| E 301 | Masterpieces of World Literature | 3 - 0 - 3 |
| CH 381 | General Biological Science | 2 - 0 - 2 |
| L 301 | French III | 3 - 0 - 3 |
| or | or | |
| L 313 | German III | 3 - 0 - 3 |

Total 17 - 0 -17

Second Semester

| | | |
|--------|-------------------------------|-----------|
| BA 302 | Cost Accounting | 3 - 0 - 3 |
| BA 310 | Management Principles | 3 - 0 - 3 |
| BA 304 | Business Law | 3 - 0 - 3 |
| E 302 | Survey of American Literature | 3 - 0 - 3 |
| SS 340 | Sociology | 2 - 0 - 2 |
| L 302 | French IV | 3 - 0 - 3 |
| or | or | |
| L 314 | German IV | 3 - 0 - 3 |

Total 17 - 0 -17

SENIOR YEAR—MANAGEMENT MAJOR

First Semester

| | | |
|--------|--------------------------|-----------|
| BA 412 | Industrial Management | 3 - 0 - 3 |
| BA 410 | Taxation | 3 - 0 - 3 |
| BA 406 | Insurance Fundamentals | 2 - 0 - 2 |
| E 401 | Technical Report Writing | 2 - 0 - 2 |
| BA 405 | Personnel Administration | 3 - 0 - 3 |
| SS 450 | Labor Relations | 3 - 0 - 3 |

Total 16 - 0 -16

Second Semester

| | | |
|--------|--------------------------------------|-----------|
| BA 413 | Industrial Management | 3 - 0 - 3 |
| BA 411 | Government Regulation of Business | 3 - 0 - 3 |
| BA 407 | Seminar in Current Business Problems | 2 - 0 - 2 |
| E 402 | Effective Speaking | 2 - 0 - 2 |
| SS 412 | Applied Psychology | 3 - 0 - 3 |
| SS 451 | Labor Relations | 3 - 0 - 3 |

Total 16 - 0 -16

CHEMISTRY

Chemistry is the study of matter, its properties and transformations. Since all manufacturing industries must start with some form of matter for the fabrication of their finished products, the science of chemistry is fundamental to all industry and for this reason, chemists are employed by many concerns other than those actually manufacturing chemicals. In recent times manufacturing companies are tending more and more to develop, on their own, new materials for specific purposes. As a result, the need for chemists is continually increasing. The advent of the space and atomic age has produced many problems that must be solved by the chemist. For example, development of materials capable of withstanding and insulating against terrific heat, rocket fuels of much greater power, stronger and lighter alloys, and lighter and more efficient materials for shielding against radiation are necessary before engineers can advance very far in space vehicle design.

The chemistry curricula at the Institute are designed to give a solid foundation in the fundamental principles of chemistry and to provide sufficient training in laboratory techniques to form a basis for specialized work in the chemical or allied industrial fields chosen by the student. Courses in the fundamental sciences of mathematics and physics coupled with instruction in the socio-humanistic studies yield a well-balanced program which prepares the student for industrial careers or for graduate school.

The Institute offers two chemistry curricula leading to a Bachelor of Science degree:

Chemistry

The Department of Chemistry offers a specialized curriculum leading to the degree of Bachelor of Science in Chemistry. Students are prepared for positions in any chemical field by arranging their course time so that approximately the same number of hours are taken in the four fundamental branches of chemistry, i.e., organic, inorganic, analytical and physical.

Textile Chemistry

The Textile Chemistry curriculum is designed to prepare students for careers as chemists or dyers in the textile, synthetic fiber, cellulose and other allied industries. Because this curriculum is mainly intended to aid the textile and allied industries by preparing qualified textile chemists, it is discussed more fully under "TEXTILES" on page 51 of this bulletin.

Chemistry Program**FRESHMAN YEAR***First Semester*

| | | |
|--------|-----------------------------------|-------------|
| Ch 111 | College Chemistry | 3 - 6 - 5† |
| M 101 | College Math I | 5 - 0 - 5 |
| E 101 | English Composition | 3 - 0 - 3 |
| SS 221 | History of Western Civilization I | 3 - 0 - 3 |
| ME 121 | Engineering Drawing | 0 - 3 - 1 |
| Total | | 14 - 9 - 17 |

Second Semester

| | | |
|--------|------------------------------------|-------------|
| Ch 112 | College Chemistry | 3 - 0 - 3 |
| M 102 | College Math II | 5 - 0 - 5 |
| Ch 113 | Qualitative Analysis | 2 - 4 - 3 |
| E 102 | English Composition | 3 - 0 - 3 |
| ME 122 | Engineering Drawing | 0 - 3 - 1 |
| SS 222 | History of Western Civilization II | 3 - 0 - 3 |
| Total | | 16 - 7 - 18 |

SOPHOMORE YEAR*First Semester*

| | | |
|--------|-----------------------|--------------|
| Ch 211 | Quantitative Analysis | 2 - 4 - 3 |
| Ch 231 | Organic Chemistry | 3 - 4 - 4 |
| M 201 | Differential Calculus | 3 - 0 - 3 |
| SS 110 | General Psychology | 2 - 0 - 2 |
| L 211 | German I | 3 - 0 - 3 |
| P 211 | College Physics I | 3 - 2 - 4 |
| Total | | 16 - 10 - 19 |

Second Semester

| | | |
|--------|-------------------------|--------------|
| Ch 212 | Quantitative Analysis | 2 - 4 - 3 |
| Ch 232 | Organic Chemistry | 3 - 4 - 4 |
| M 202 | Integral Calculus | 3 - 0 - 3 |
| SS 230 | Principles of Economics | 3 - 0 - 3 |
| L 212 | German II | 3 - 0 - 3 |
| P 212 | College Physics II | 3 - 2 - 4 |
| Total | | 17 - 10 - 20 |

† Refer to page 67 for an explanation of course coding systems.

JUNIOR YEAR

First Semester

| | | |
|--------------|----------------------------|-------------------|
| Ch 332 | Advanced Organic Chemistry | 3 - 4 - 4 |
| Ch 311 | Instrumental Analysis | 2 - 4 - 3 |
| L 313 | German III | 3 - 0 - 3 |
| SS 340 | Sociology | 2 - 0 - 2 |
| Ch 351 | Bacteriology | 2 - 6 - 4 |
| | Elective | 3 - 0 - 3 |
| Total | | 15 -14 -19 |

Second Semester

| | | |
|--------------|-----------------------|-------------------|
| Ch 312 | Instrumental Analysis | 2 - 4 - 3 |
| Ch 365 | Chemical Metallurgy | 2 - 0 - 2 |
| Ch 360 | Chemical Literature | 2 - 0 - 2 |
| TE 307 | Microscopy | 1 - 2 - 2 |
| Ch 352 | Microbiology | 2 - 6 - 4 |
| | Electives | 6 - 0 - 6 |
| Total | | 15 -12 -19 |

SENIOR YEAR

First Semester

| | | |
|--------------|------------------------------|-------------------|
| Ch 411 | Physical Chemistry | 4 - 3 - 5 |
| Ch 461 | Organic Qualitative Analysis | 2 - 4 - 3 |
| Ch 441 | Industrial Chemical Analysis | 2 - 6 - 4 |
| E 401 | Technical Report Writing | 2 - 0 - 2 |
| SS 412 | Applied Psychology | 3 - 0 - 3 |
| Total | | 13 -13 -17 |

Second Semester

| | | |
|--------------|-------------------------------|-------------------|
| Ch 412 | Physical Chemistry | 4 - 3 - 5 |
| Ch 442 | Industrial Chemical Analysis | 2 - 6 - 4 |
| E 402 | Effective Speaking | 3 - 0 - 3 |
| Ch 462 | Organic Quantitative Analysis | 2 - 4 - 3 |
| Total | | 11 -13 -15 |

ELECTIVES

| | | |
|------------|-------------------------------------|-----------|
| Ch 382 | History of Chemistry | 2 - 0 - 2 |
| Ch 393 | Biochemistry | 2 - 3 - 3 |
| Ch 401 | Colloid Chemistry | 2 - 3 - 3 |
| Ch 481 | The Chemistry of Food and Nutrition | 2 - 3 - 3 |
| Ch 491 | Industrial Chemistry | 3 - 0 - 3 |
| SS 413 | Psychology of Adjustment | 3 - 0 - 3 |
| SS 414 | Social Psychology | 3 - 0 - 3 |
| M 301 | Differential Equations | 3 - 0 - 3 |
| M 221, 222 | Statistics I, II | 3 - 0 - 3 |
| E 301 | Masterpieces of World Literature | 3 - 0 - 3 |

ENGINEERING

With the ever-increasing influence of science and technology on our civilization, the demand of modern industry for young engineers, competently trained and capable of assuming responsibilities, has likewise increased.

The engineering curricula at the Institute are designed to meet the rapid changes of our day and to prepare qualified young men and women interested in an engineering career. The content of each curriculum is arranged to provide a well-rounded professional education by maintaining a proper balance between the fundamental sciences of mathematics, chemistry and physics; the socio-humanistic studies such as English, literature, economics and psychology; and the required basic engineering and technological subjects.

Specific options or majors are not offered by the Institute's engineering curricula. Each curriculum, however, is organized to give a thorough training in the various phases of the field of specialization without over-emphasizing any one phase to the neglect of any others. Specialization in any one phase is left for industry or to graduate study.

Inasmuch as the fundamentals of engineering are common to all segments of this profession, the program of study for all freshman engineering majors is basically the same. This allows the student an opportunity to reverse any decision made earlier as to the engineering curriculum best adapted to his abilities and interests. It also allows faculty advisers to help the student in deciding where his potential can be more fully realized.

The Institute offers three Bachelor of Science degrees in the field of engineering:

Electrical Engineering

Electrical Engineering is concerned with the generation and utilization of electrical energy. With the rapid expansion of this field many new areas of specialization such as instrumentation, computation, guidance, control and automation have become part of the Electrical Engineering field, yet only yesterday these areas were unknown. For this reason, it is felt that tomorrow many of our present-day students will find themselves working with aspects of Electrical Engineering which today are virtually unknown.

The curriculum in Electrical Engineering contains a select series of fundamental studies to provide the student with the background necessary to meet the challenges of the present and of the future. In keeping with current thought relative to engineering curricula, a study of the basic concepts of mathematics, chemistry and physics is emphasized during the first two years; engineering sciences and the applicability of these sciences to engineering analysis and design is developed in the latter two years.

Mechanical Engineering

Mechanical Engineering extends into practically all branches of manufacturing and processing industries, as well as power generation, transportation and plant construction.

In each industry there are several functions which the Mechanical Engineer may perform; that is, he may be assigned to general research, or to testing of materials or to testing of machine elements. He may be employed in the design of machinery relative to the development of manufacturing processes and plants; he may be engaged in the construction of machinery and in the production of goods; he may become associated with plant efficiency or with problems of management; or he may be attracted to the excellent opportunities in sales engineering. In all cases, placement in these fields leads to positions of responsibility and trust.

Emphasis in the freshman and sophomore years is placed on the fundamental sciences of mathematics, physics and chemistry common to all engineering curricula. In the junior and senior years, such subjects as strength of materials, metallurgy, applied mechanics, thermodynamics, fluid mechanics, electronics and electrical engineering are given the greater emphasis. The Mechanical Engineering curriculum also offers exceptional opportunities for training in the fundamentals of machine design. A laboratory program including design, machine shop and engineering laboratory experiments provides association with the practical application of engineering operations.

Textile Engineering

The curriculum in Textile Engineering is especially designed for students interested in positions in the textile and allied industries which may involve research and engineering principles.

Eighty-two credit hours or approximately fifty-five percent of this curriculum is devoted to the fundamental sciences and engineering subjects necessary to any engineering program. The student obtains both a solid engineering background and a sufficient knowledge of the techniques employed in the processing of fibers, whether natural or synthetic, into yarn and fabrics of varying characteristics. The student also learns the methods used in the dyeing and finishing of textile products as well as the methods used in the testing of fiber, yarn and fabric strength and appearance characteristics.

The Textile Engineering curriculum also affords an excellent opportunity to students interested in furthering their study on the graduate level.

Electrical Engineering Program**FRESHMAN YEAR***First Semester*

| | | |
|--------|-----------------------------------|-------------|
| M 101 | College Math I | 5 - 0 - 5† |
| Ch 111 | College Chemistry | 3 - 2 - 4 |
| ME 131 | Engineering Drawing | 0 - 6 - 3 |
| E 101 | English Composition | 3 - 0 - 3 |
| SS 221 | History of Western Civilization I | 3 - 0 - 3 |
| Total | | 14 - 8 - 18 |

Second Semester

| | | |
|--------|------------------------------------|-------------|
| M 102 | College Math II | 5 - 0 - 5 |
| Ch 112 | College Chemistry | 3 - 2 - 4 |
| P 102 | Engineering Physics I | 3 - 2 - 4 |
| E 102 | English Composition | 3 - 0 - 3 |
| SS 222 | History of Western Civilization II | 3 - 0 - 3 |
| Total | | 17 - 4 - 19 |

SOPHOMORE YEAR*First Semester*

| | | |
|--------|------------------------------------|-------------|
| M 201 | Differential Calculus | 3 - 0 - 3 |
| ME 211 | Descriptive Geometry | 2 - 3 - 3 |
| ME 217 | Engineering Metallurgy | 2 - 0 - 2 |
| P 201 | Engineering Physics II | 3 - 2 - 4 |
| EE 202 | Elements of Electrical Engineering | 4 - 0 - 4 |
| SS 230 | Principles of Economics | 3 - 0 - 3 |
| Total | | 17 - 5 - 19 |

Second Semester

| | | |
|--------|-------------------------|-------------|
| M 202 | Integral Calculus | 3 - 0 - 3 |
| ME 218 | Engineering Metallurgy | 2 - 2 - 3 |
| ME 214 | Mechanics (Statics) | 3 - 0 - 3 |
| P 202 | Engineering Physics III | 3 - 2 - 4 |
| EE 203 | Electric Circuits | 3 - 2 - 4 |
| SS 110 | General Psychology | 2 - 0 - 2 |
| Total | | 16 - 6 - 19 |

† Refer to page 67 for an explanation of course coding systems.

JUNIOR YEAR

First Semester

| | | |
|---------|-------------------------------|-------------|
| M 301 | Differential Equations | 3 - 0 - 3 |
| ME 320 | Thermodynamics | 3 - 0 - 3 |
| ME 310 | Mechanics (Dynamics) | 3 - 0 - 3 |
| EE 310 | Electric Machinery | 3 - 0 - 3 |
| EE 310L | Electric Machinery Laboratory | 0 - 2 - 1 |
| SS 340 | Sociology | 2 - 0 - 2 |
| EE 317 | Electromagnetics | 3 - 0 - 3 |
| Total | | 17 - 2 - 18 |

Second Semester

| | | |
|---------|----------------------------------|-------------|
| ME 321 | Thermodynamics | 3 - 0 - 3 |
| ME 313 | Strength of Materials | 3 - 2 - 4 |
| EE 309 | Network Analysis | 3 - 0 - 3 |
| EE 304 | Electronics I | 3 - 0 - 3 |
| EE 304L | Electronics Laboratory I | 0 - 2 - 1 |
| E 301 | Masterpieces of World Literature | 3 - 0 - 3 |
| Total | | 15 - 4 - 17 |

SENIOR YEAR

First Semester

| | | |
|---------|----------------------------------|-------------|
| E 401 | Report Writing | 2 - 0 - 2 |
| EE 410 | Filter and Transmission Circuits | 3 - 0 - 3 |
| EE 405 | Electronics II | 3 - 0 - 3 |
| EE 405L | Electronics Laboratory II | 0 - 2 - 1 |
| ME 425 | Fluid Mechanics | 3 - 0 - 3 |
| SS 412 | Applied Psychology | 3 - 0 - 3 |
| | Elective (Group A) | 3 - 0 - 3 |
| Total | | 17 - 2 - 18 |

Second Semester

| | | |
|--------|-----------------------|-------------|
| E 402 | Effective Speaking | 2 - 0 - 2 |
| EE 413 | Servomechanisms | 3 - 2 - 4 |
| | Non-Technical Subject | 3 - 0 - 3 |
| | Elective (Group A)* | 9 - 0 - 9 |
| Total | | 17 - 2 - 18 |

* Six credit hours must be chosen in the Electrical Engineering Department.

ELECTIVES

Group A

| | | |
|--------|--|-----------|
| M 302 | Selected Topics in Advanced Calculus | 3 - 0 - 3 |
| EE 409 | System Dynamics | 3 - 0 - 3 |
| EE 415 | Advanced Electric Machinery | 3 - 0 - 3 |
| EE 416 | Transistor Circuits | 3 - 0 - 3 |
| EE 417 | Transient Analysis | 3 - 0 - 3 |
| EE 418 | Analysis of E.E. Problems | 3 - 0 - 3 |
| EE 421 | Electric Power Systems | 3 - 0 - 3 |
| EE 422 | Introduction to Information Theory | 3 - 0 - 3 |
| EE 424 | Introduction to Computational Circuits | 3 - 0 - 3 |
| EE 425 | Wave Forming Circuits | 3 - 0 - 3 |
| ME 424 | Vibrations | 3 - 0 - 3 |
| P 301 | Modern Physics | 3 - 0 - 3 |
| EE 406 | Theory of Electrical Measurements | 2 - 2 - 3 |

Mechanical Engineering Program

FRESHMAN YEAR

First Semester

| | | |
|--------|-----------------------------------|-------------|
| M 101 | College Math I | 5 - 0 - 5† |
| Ch 111 | College Chemistry | 3 - 2 - 4 |
| ME 111 | Engineering Drawing | 0 - 6 - 3 |
| E 101 | English Composition | 3 - 0 - 3 |
| SS 221 | History of Western Civilization I | 3 - 0 - 3 |
| Total | | 14 - 8 - 18 |

Second Semester

| | | |
|--------|------------------------------------|--------------|
| M 102 | College Math II | 5 - 0 - 5 |
| Ch 112 | College Chemistry | 3 - 2 - 4 |
| ME 112 | Engineering Drawing | 0 - 6 - 3 |
| P 102 | Engineering Physics I | 3 - 2 - 4 |
| E 102 | English Composition | 3 - 0 - 3 |
| SS 222 | History of Western Civilization II | 3 - 0 - 3 |
| Total | | 17 - 10 - 22 |

SOPHOMORE YEAR

First Semester

| | | |
|---------|------------------------------------|-------------|
| P 201 | Engineering Physics II | 3 - 2 - 4 |
| M 201 | Differential Calculus | 3 - 0 - 3 |
| ME 217 | Engineering Metallurgy | 2 - 0 - 2 |
| ME 211 | Descriptive Geometry | 2 - 3 - 3 |
| ME 201 | Manufacturing Processes | 2 - 0 - 2 |
| ME 201L | Manufacturing Processes Laboratory | 0 - 3 - 1 |
| SS 230 | Principles of Economics | 3 - 0 - 3 |
| Total | | 15 - 8 - 18 |

Second Semester

| | | |
|---------|------------------------------------|-------------|
| P 202 | Engineering Physics III | 3 - 2 - 4 |
| M 202 | Integral Calculus | 3 - 0 - 3 |
| ME 218 | Engineering Metallurgy | 2 - 2 - 3 |
| ME 214 | Mechanics (Statics) | 3 - 0 - 3 |
| ME 202 | Manufacturing Processes | 2 - 0 - 2 |
| ME 202L | Manufacturing Processes Laboratory | 0 - 3 - 1 |
| SS 110 | General Psychology | 2 - 0 - 2 |
| Total | | 15 - 7 - 18 |

† Refer to page 67 for an explanation of course coding systems.

JUNIOR YEAR

First Semester

| | | |
|---------|------------------------------------|-------------|
| ME 320 | Thermodynamics | 3 - 0 - 3 |
| ME 310 | Mechanics (Dynamics) | 3 - 0 - 3 |
| ME 314 | Strength of Materials | 3 - 0 - 3 |
| ME 314L | Strength of Materials Laboratory | 0 - 3 - 1 |
| EE 202 | Elements of Electrical Engineering | 4 - 0 - 4 |
| M 301 | Differential Equations | 3 - 0 - 3 |
| E 301 | Masterpieces of World Literature | 3 - 0 - 3 |
| Total | | 19 - 3 - 20 |

Second Semester

| | | |
|--------|------------------------------|-------------|
| ME 321 | Thermodynamics | 3 - 0 - 3 |
| ME 316 | Mechanisms | 2 - 3 - 3 |
| ME 322 | Machine Design I | 2 - 3 - 3 |
| ME 315 | Strength of Materials | 3 - 0 - 3 |
| EE 203 | Alternating Current Circuits | 3 - 2 - 4 |
| SS 340 | Sociology | 2 - 0 - 2 |
| Total | | 15 - 8 - 18 |

SENIOR YEAR

First Semester

| | | |
|--------|--------------------------|-------------|
| EE 310 | Electric Machinery | 3 - 2 - 4 |
| ME 425 | Fluid Mechanics | 3 - 0 - 3 |
| ME 421 | Machine Design II | 2 - 3 - 3 |
| ME 419 | Tool Design | 2 - 2 - 3 |
| E 401 | Technical Report Writing | 2 - 0 - 2 |
| SS 412 | Applied Psychology | 3 - 0 - 3 |
| Total | | 15 - 7 - 18 |

Second Semester

| | | |
|--------|------------------------------------|--------------|
| EE 423 | Elements of Industrial Electronics | 3 - 2 - 4 |
| ME 420 | Industrial Engineering | 2 - 2 - 3 |
| ME 422 | Machine Design III | 2 - 3 - 3 |
| ME 424 | Vibrations | 3 - 0 - 3 |
| E 402 | Effective Speaking | 2 - 0 - 2 |
| ME 426 | Mechanical Engineering Laboratory | 0 - 3 - 2 |
| Total | | 12 - 10 - 17 |

Textile Engineering Program**FRESHMAN YEAR***First Semester*

| | | |
|--------------|-----------------------------------|--------------------|
| M 101 | College Math I | 5 - 0 - 5† |
| Ch 101 | College Chemistry | 3 - 2 - 4 |
| E 101 | English Composition | 3 - 0 - 3 |
| ME 131 | Engineering Drawing | 0 - 6 - 3 |
| SS 221 | History of Western Civilization I | 3 - 0 - 3 |
| Total | | 14 - 8 - 18 |

Second Semester

| | | |
|--------------|------------------------------------|--------------------|
| M 102 | College Math II | 5 - 0 - 5 |
| Ch 102 | College Chemistry | 3 - 2 - 4 |
| E 102 | English Composition | 3 - 0 - 3 |
| P 102 | Engineering Physics I | 3 - 2 - 4 |
| SS 222 | History of Western Civilization II | 3 - 0 - 3 |
| Total | | 17 - 4 - 19 |

SOPHOMORE YEAR*First Semester*

| | | |
|--------------|-------------------------|--------------------|
| P 201 | Engineering Physics II | 3 - 2 - 4 |
| M 201 | Differential Calculus | 3 - 0 - 3 |
| ME 217 | Engineering Metallurgy | 2 - 0 - 2 |
| ME 211 | Descriptive Geometry | 2 - 3 - 3 |
| SS 230 | Principles of Economics | 3 - 0 - 3 |
| TE 200 | Yarn Technology | 2 - 2 - 3 |
| Total | | 15 - 7 - 18 |

Second Semester

| | | |
|--------------|-------------------------|--------------------|
| P 202 | Engineering Physics III | 3 - 2 - 4 |
| M 202 | Integral Calculus | 3 - 0 - 3 |
| ME 218 | Engineering Metallurgy | 2 - 2 - 3 |
| ME 214 | Mechanics (Statics) | 3 - 0 - 3 |
| SS 110 | General Psychology | 2 - 0 - 2 |
| TE 201 | Yarn Technology | 2 - 2 - 3 |
| Total | | 15 - 6 - 18 |

† Refer to page 67 for an explanation of course coding systems.

JUNIOR YEAR

First Semester

| | | |
|--------|------------------------------------|-------------|
| ME 320 | Thermodynamics | 3 - 0 - 3 |
| EE 202 | Elements of Electrical Engineering | 4 - 0 - 4 |
| ME 310 | Mechanics (Dynamics) | 3 - 0 - 3 |
| TE 300 | Yarn Technology | 2 - 2 - 3 |
| TE 202 | Fabric Technology | 2 - 2 - 3 |
| E 301 | Masterpieces of World Literature | 3 - 0 - 3 |
| Total | | 17 - 4 - 19 |

Second Semester

| | | |
|--------|------------------------------|-------------|
| ME 321 | Thermodynamics | 3 - 0 - 3 |
| EE 203 | Alternating Current Circuits | 3 - 2 - 4 |
| ME 313 | Strength of Materials | 3 - 2 - 4 |
| TE 301 | Yarn Technology | 2 - 2 - 3 |
| TE 203 | Fabric Technology | 2 - 2 - 3 |
| SS 340 | Sociology | 2 - 0 - 2 |
| Total | | 15 - 8 - 19 |

SENIOR YEAR

First Semester

| | | |
|--------------------|--------------------------|-------------|
| EE 310 | Electric Machinery | 3 - 2 - 4 |
| E 401 | Technical Report Writing | 2 - 0 - 2 |
| Ch 400 | Dyeing Technology | 2 - 2 - 3 |
| TE 400 | Physical Testing | 2 - 2 - 3 |
| TE 302 | Fabric Technology | 2 - 2 - 3 |
| SS 412 | Applied Psychology | 3 - 0 - 3 |
| | | 14 - 8 - 18 |
| Elective | | 2 or 3 |
| Total Credit Hours | | 20 or 21 |

Second Semester

| | | |
|--------------------|------------------------------------|-------------|
| EE 423 | Elements of Industrial Electronics | 3 - 2 - 4 |
| E 402 | Effective Speaking | 2 - 0 - 2 |
| ME 420 | Industrial Engineering | 2 - 2 - 3 |
| Ch 403 | Finishing Technology | 2 - 0 - 2 |
| TE 303 | Fabric Technology | 2 - 2 - 3 |
| | | 11 - 6 - 14 |
| Elective | | 2 or 3 |
| Total Credit Hours | | 16 or 17 |

ELECTIVES

| | | |
|-------------|-----------------------------|-----------|
| TE 204, 205 | Fabric Design and Structure | 2 - 2 - 3 |
| M 221 | Statistics I | 3 - 0 - 3 |
| TE 404 | Quality Control | 3 - 0 - 3 |
| Ch 402 | Structure of Textile Fibers | 2 - 0 - 2 |
| TE 401 | Microscopy | 1 - 3 - 2 |

TEXTILES

Because food, clothing and shelter are recognized as the three basic needs of man, the manufacture of textiles has become one of the world's leading industries. For this reason, the textile industry has so developed that it now ranks among the top five American industries in value of its product. It has been estimated that one-sixth of the total working population is employed in textile and allied industries.

Recent developments in new fibers, methods of processing, and dyeing and finishing technology have resulted in the need for specially trained men and women with a knowledge of the technology of textile processing and/or chemistry and engineering. Because the industry also recognizes the importance of a well-rounded education, it is felt that a knowledge of socio-humanistic studies, along with accounting and management, will allow the textile graduate to meet more successfully the demands made of him.

Because of the size and diversity of textile and related industries, numerous opportunities are available for young men and women whose interests might lie in research, engineering, production, technology, sales, marketing, chemistry, design and fashion, and management. Starting salaries in the textile industry are comparable to those of any other major industry. Ambitious and alert college graduates will find excellent opportunities for advancement in these fields. A recent survey has shown that textile executives reach the top sooner and hold their jobs longer than any other industrial executive.

The Institute offers four textile curricula leading to a Bachelor of Science degree:

Textile Chemistry

The Textile Chemistry curriculum is designed to prepare students for careers as chemists or dyers in the textile, synthetic fiber, cellulose and other allied industries. This curriculum also provides a sound background for careers in sales and technical services. It provides a fundamental training in the fields of inorganic, organic, analytical, physical and textile chemistry. Courses in the social sciences and humanities as well as other basic sciences provide a well-rounded program which prepares the student for industrial professions or for graduate training.

Textile Design and Fashion

Modern advancements in textile technology point up a paramount need for a co-ordination of the special techniques of fabric and apparel designers. The styling, designing and development of fabrics and textures now require an expanded technical knowledge on the part of those concerned with the artistic and functional elements of textile materials.

The Textile Design and Fashion curriculum at the Institute offers the student instruction in design, drawing, painting and the history of art as the principal subjects during the Freshman Year. The latter

years are concerned with such courses as applied textile design, theories and practical studies in textile manufacturing, graphic arts and further studies in the history of art, drawing and painting. With the exception of the Freshman Year, projects are completed whereby students create and execute their own original fabric and apparel designs.

To give the student a well-balanced college education, courses in the socio-humanistic studies, such as English composition, psychology, economics and literature are included in the curriculum.

Textile Engineering

The curriculum in Textile Engineering is especially designed for students interested in positions in textile and allied industries which may involve research and engineering principles. Because this course is basically an engineering curriculum, it is discussed more fully under the engineering section of this bulletin, page 43.

Textile Technology

The curriculum in Textile Technology is designed to prepare students to become competent textile technologists for eventual supervisory, administrative, or executive positions within the industry and related fields. This curriculum also provides a sound background for careers in sales and technical services. The main concern of this program is to acquaint the student with the theories and practical applications of yarn and fabric processing, fabric design and structure, determination of fiber and fabric strength and appearance characteristics, and the technology of dyeing and printing. The student is also acquainted with the properties, characteristics, uses, types, and availability of all textile fibers, natural or man-made. Twenty-six credit hours or sixteen percent of this curriculum is devoted to accounting and management courses. Such courses prepare and aid the individual for administrative and managerial positions. An equal percentage of the curriculum is also devoted to socio-humanistic studies in order to give the student a well-balanced education.

Knitting Option. This option in the Junior and Senior years has been made available so that the knitting segment of the textile industry may receive trained personnel in the fundamentals and practices of processing knitted textiles. Because of the selected courses in this curriculum, students will be prepared for a future not only in the knitting industry, but also in the yarn manufacturing industry. In either case, the student will have a background sufficient to allow him, should he so desire, to enter the fields of sales and technical services.

Textile Chemistry Program**FRESHMAN YEAR***First Semester*

| | | |
|--------|-----------------------------------|------------|
| Ch 111 | College Chemistry | 3 - 6 - 5† |
| M 101 | College Math I | 5 - 0 - 5 |
| E 101 | English Composition | 3 - 0 - 3 |
| ME 121 | Engineering Drawing | 0 - 3 - 1 |
| SS 221 | History of Western Civilization I | 3 - 0 - 3 |
| TE 101 | Introductory Survey of Textiles | 1 - 0 - 1 |

| | |
|--------|-------------|
| Totals | 15 - 9 - 18 |
|--------|-------------|

Second Semester

| | | |
|--------|------------------------------------|-----------|
| Ch 112 | College Chemistry | 3 - 0 - 3 |
| M 102 | College Math II | 5 - 0 - 5 |
| E 102 | English Composition | 3 - 0 - 3 |
| ME 122 | Engineering Drawing | 0 - 3 - 1 |
| SS 222 | History of Western Civilization II | 3 - 0 - 3 |
| TE 103 | Fiber Technology | 1 - 0 - 1 |
| Ch 113 | Qualitative Analysis | 2 - 4 - 3 |

| | |
|-------|-------------|
| Total | 17 - 7 - 19 |
|-------|-------------|

SOPHOMORE YEAR*First Semester*

| | | |
|--------|--------------------------------|-----------|
| Ch 211 | Quantitative Analysis | 2 - 4 - 3 |
| Ch 221 | Introductory Textile Chemistry | 2 - 4 - 3 |
| Ch 231 | Organic Chemistry | 3 - 4 - 4 |
| M 201 | Differential Calculus | 3 - 0 - 3 |
| SS 110 | General Psychology | 2 - 0 - 2 |
| TE 210 | Fabric Classification | 1 - 0 - 1 |
| P 211 | College Physics I | 3 - 2 - 4 |

| | |
|-------|--------------|
| Total | 16 - 14 - 20 |
|-------|--------------|

Second Semester

| | | |
|--------|-------------------------|-----------|
| Ch 212 | Quantitative Analysis | 2 - 4 - 3 |
| Ch 222 | Dyeing | 2 - 4 - 3 |
| Ch 232 | Organic Chemistry | 3 - 4 - 4 |
| M 202 | Integral Calculus | 3 - 0 - 3 |
| TE 211 | Fabric Classification | 1 - 0 - 1 |
| P 212 | College Physics II | 3 - 2 - 4 |
| SS 230 | Principles of Economics | 3 - 0 - 3 |

| | |
|-------|--------------|
| Total | 17 - 14 - 21 |
|-------|--------------|

† Refer to page 67 for an explanation of course coding systems.

JUNIOR YEAR

First Semester

| | | |
|--------|----------------------------|------------|
| Ch 331 | Advanced Organic Chemistry | 3 - 6 - 5 |
| Ch 311 | Instrumental Analysis | 2 - 4 - 3 |
| Ch 341 | Textile Printing | 2 - 4 - 3 |
| SS 340 | Sociology | 2 - 0 - 2 |
| TE 306 | Physical Testing | 1 - 2 - 2 |
| Ch 351 | Bacteriology | 2 - 6 - 4 |
| Total | | 12 -22 -19 |

Second Semester

| | | |
|--------|-----------------------|-----------|
| Ch 312 | Instrumental Analysis | 2 - 4 - 3 |
| Ch 321 | Advanced Dyeing | 1 - 6 - 3 |
| Ch 342 | Textile Printing | 2 - 4 - 3 |
| TE 308 | Color | 1 - 0 - 1 |
| TE 307 | Microscopy | 1 - 2 - 2 |
| Ch 352 | Microbiology | 2 - 6 - 4 |
| Total | | 9 -22 -16 |

SENIOR YEAR

First Semester

| | | |
|--------|------------------------------|------------|
| Ch 411 | Physical Chemistry | 4 - 3 - 5 |
| Ch 421 | Advanced Dyeing | 1 - 3 - 2 |
| Ch 441 | Industrial Chemical Analysis | 2 - 6 - 4 |
| Ch 451 | Textile Finishing | 1 - 6 - 3 |
| E 401 | Technical Report Writing | 2 - 0 - 2 |
| SS 412 | Applied Psychology | 3 - 0 - 3 |
| Total | | 13 -18 -19 |

Second Semester

| | | |
|--------|------------------------------|------------|
| Ch 412 | Physical Chemistry | 4 - 3 - 5 |
| Ch 431 | Chemistry of Textile Fibers | 3 - 3 - 4 |
| Ch 442 | Industrial Chemical Analysis | 2 - 6 - 4 |
| Ch 452 | Textile Finishing | 1 - 6 - 3 |
| E 402 | Effective Speaking | 2 - 0 - 2 |
| Total | | 12 -18 -18 |

Textile Design and Fashion Program**FRESHMAN YEAR***First Semester*

| | | |
|--------|-----------------------------------|--------|
| TD 101 | Nature Drawing | 3 - 2† |
| TD 103 | Life Drawing | 3 - 2 |
| TD 105 | Drawing and Painting | 3 - 1 |
| TD 107 | Design | 8 - 4 |
| TD 113 | Lettering | 2 - 1 |
| TD 114 | History of Art | 2 - 2 |
| TD 111 | Anatomy | 1 - 1 |
| E 101 | English Composition | 3 - 3 |
| SS 221 | History of Western Civilization I | 3 - 3 |
| TE 101 | Introductory Survey of Textiles | 1 - 1 |

Total 29 -20

Second Semester

| | | |
|--------|------------------------------------|-------|
| TD 102 | Nature Drawing | 3 - 2 |
| TD 104 | Life Drawing | 3 - 2 |
| TD 106 | Drawing and Painting | 3 - 1 |
| TD 108 | Design | 8 - 4 |
| TD 116 | Projection Drawing | 2 - 1 |
| TD 115 | History of Art | 2 - 2 |
| TD 112 | Anatomy | 1 - 1 |
| E 102 | English Composition | 3 - 3 |
| SS 222 | History of Western Civilization II | 3 - 3 |
| TE 102 | Fabric Classification | 1 - 1 |

Total 29 -20

SOPHOMORE YEAR*First Semester*

| | | |
|--------|-----------------------------------|-------|
| TD 202 | Life Drawing | 3 - 2 |
| TD 204 | Drawing and Painting | 3 - 1 |
| TD 201 | Nature Drawing | 3 - 2 |
| TD 206 | History of Art | 2 - 2 |
| TD 208 | Textile Design | 4 - 3 |
| SS 110 | General Psychology | 2 - 2 |
| Ch 203 | Introductory Dyeing | 3 - 2 |
| TE 206 | Elements of Textile Manufacturing | 4 - 3 |
| TE 208 | Fabric Design and Structure | 4 - 3 |

Total 28 -20

Second Semester

| | | |
|--------|-----------------------------------|-------|
| TD 203 | Life Drawing | 3 - 2 |
| TD 205 | Drawing and Painting | 3 - 1 |
| TD 210 | Fashion Illustration | 2 - 1 |
| SS 230 | Principles of Economics | 3 - 3 |
| TD 209 | Textile Design | 8 - 6 |
| TE 207 | Elements of Textile Manufacturing | 4 - 3 |
| TE 209 | Fabric Design and Structure | 4 - 3 |

Total 27 -19

† Refer to page 67 for an explanation of course coding systems.

JUNIOR YEAR

First Semester

| | | |
|--------|------------------------|-------|
| TD 301 | Textile Design | 8 - 6 |
| TD 308 | Handloom Weaving | 4 - 2 |
| TD 315 | History of Costume | 2 - 2 |
| TD 310 | Apparel Design | 4 - 3 |
| TD 312 | Fashion Illustration* | 3 - 2 |
| or | | |
| TD 320 | Graphic Arts* | 3 - 2 |
| SS 340 | Sociology | 2 - 2 |
| TE 309 | Stitching and Knitting | 2 - 1 |

Total 25 -18

Second Semester

| | | |
|--------|----------------------------------|-------|
| TD 302 | Textile Design | 8 - 6 |
| TD 309 | Handloom Weaving | 4 - 2 |
| TD 316 | History of Costume | 2 - 2 |
| TD 311 | Apparel Design | 4 - 3 |
| TD 313 | Fashion Illustration | 3 - 2 |
| or | | |
| TD 321 | Graphic Arts | 3 - 2 |
| E 301 | Masterpieces of World Literature | 3 - 3 |
| | Elective† | 2 |

Total 24 -20

SENIOR YEAR

First Semester

| | | |
|--------|--------------------------|-------|
| TD 401 | Textile Design | 6 - 4 |
| TD 403 | Handloom Weaving | 2 - 1 |
| TD 407 | Apparel Design | 4 - 3 |
| TD 405 | Fashion Illustration | 4 - 3 |
| or | | |
| TD 420 | Graphic Arts | 4 - 3 |
| SS 412 | Applied Psychology | 3 - 3 |
| E 401 | Technical Report Writing | 2 - 2 |
| TE 405 | Fabric Testing | 2 - 1 |
| Ch 403 | Finishing Technology | 2 - 2 |

Total 25 -19

Second Semester

| | | |
|--------|----------------------|-------|
| TD 402 | Textile Design | 8 - 6 |
| TD 404 | Handloom Weaving | 2 - 1 |
| TD 408 | Apparel Design | 4 - 3 |
| TD 406 | Fashion Illustration | 4 - 3 |
| or | | |
| TD 421 | Graphic Arts | 4 - 3 |
| E 402 | Effective Speaking | 2 - 2 |
| TD 409 | Degree Project | 6 - 3 |
| | Elective† | 2 |

Total 26 -20

* A student has the option of choosing for two years either Fashion Illustration or Graphic Arts.

† Elective to be selected in consultation with the student's adviser.

Textile Technology Program**FRESHMAN YEAR***First Semester*

| | | |
|--------|-----------------------------------|-------------|
| E 101 | English Composition | 3 - 0 - 3† |
| SS 221 | History of Western Civilization I | 3 - 0 - 3 |
| BA 101 | Accounting Principles | 3 - 2 - 4 |
| ME 121 | Engineering Drawing | 0 - 4 - 2 |
| M 100A | Introductory Math | 3 - 0 - 3 |
| Ch 101 | Introductory Chemistry | 3 - 2 - 4 |
| Total | | 15 - 7 - 18 |

Second Semester

| | | |
|--------|------------------------------------|-------------|
| E 102 | English Composition | 3 - 0 - 3 |
| SS 222 | History of Western Civilization II | 3 - 0 - 3 |
| BA 102 | Accounting Principles | 3 - 2 - 4 |
| ME 122 | Engineering Drawing | 0 - 4 - 2 |
| M 100B | Introductory Math | 3 - 0 - 3 |
| Ch 102 | Introductory Chemistry | 3 - 2 - 4 |
| TE 100 | Introductory Textiles | 2 - 0 - 2 |
| Total | | 17 - 7 - 20 |

SOPHOMORE YEAR*First Semester*

| | | |
|--------|-----------------------------|-------------|
| SS 110 | General Psychology | 2 - 0 - 2 |
| P 211 | College Physics I | 3 - 2 - 4 |
| TE 200 | Yarn Technology | 2 - 2 - 3 |
| TE 202 | Fabric Technology | 2 - 2 - 3 |
| TE 204 | Fabric Design and Structure | 2 - 2 - 3 |
| BA 206 | Marketing Principles* | 3 - 0 - 3 |
| Total | | 14 - 8 - 18 |

Second Semester

| | | |
|--------|-----------------------------|-------------|
| SS 230 | Principles of Economics | 3 - 0 - 3 |
| P 212 | College Physics II | 3 - 2 - 4 |
| TE 201 | Yarn Technology | 2 - 2 - 3 |
| TE 203 | Fabric Technology | 2 - 2 - 3 |
| TE 205 | Fabric Design and Structure | 2 - 2 - 3 |
| BA 207 | Marketing Principles* | 3 - 0 - 3 |
| Total | | 15 - 8 - 19 |

† Refer to page 67 for an explanation of course coding systems.

* Further courses in accounting may be taken by any student who has acquired a C+ or better average in Accounting Principles during the Freshman Year. Intermediate and Advanced Accounting (BA 201, 202) may be taken during the Sophomore Year and Cost Accounting (BA 301, 302) during the Junior Year. These courses in accounting will be substituted for those indicated by an asterisk, and no student will be allowed to drop this option once selected.

JUNIOR YEAR

First Semester

| | | |
|--------|-----------------------------------|-----------|
| E 301 | Masterpieces of World Literature | 3 - 0 - 3 |
| EE 318 | Elements of Circuits and Machines | 3 - 2 - 4 |
| TE 300 | Yarn Technology | 2 - 2 - 3 |
| TE 302 | Fabric Technology | 2 - 2 - 3 |
| TE 304 | Fabric Design and Structure | 2 - 2 - 3 |
| BA 309 | Management Principles* | 3 - 0 - 3 |
| Total | | 15 - 8-19 |

Second Semester

| | | |
|--------|---|------------|
| SS 340 | Sociology | 2 - 0 - 2 |
| EE 319 | Textile Application of Machines and Control | 3 - 2 - 4 |
| TE 301 | Yarn Technology | 2 - 2 - 3 |
| TE 303 | Fabric Technology | 2 - 2 - 3 |
| TE 305 | Fabric Design and Structure | 2 - 2 - 3 |
| BA 310 | Management Principles* | 3 - 0 - 3 |
| Total | | 14 - 8 -18 |

SENIOR YEAR

First Semester

| | | |
|--------|-----------------------------|------------|
| E 401 | Technical Report Writing | 2 - 0 - 2 |
| TE 402 | Mill Engineering | 2 - 0 - 2 |
| BA 412 | Industrial Management | 3 - 0 - 3 |
| TE 400 | Physical Testing | 2 - 2 - 3 |
| Ch 400 | Dyeing Technology | 2 - 2 - 3 |
| M 221 | Statistics I | 3 - 0 - 3 |
| Ch 402 | Structure of Textile Fibers | 2 - 0 - 2 |
| Total | | 16 - 4 -18 |

Second Semester

| | | |
|--------|-----------------------|------------|
| E 402 | Effective Speaking | 2 - 0 - 2 |
| SS 412 | Applied Psychology | 3 - 0 - 3 |
| BA 413 | Industrial Management | 3 - 0 - 3 |
| TE 401 | Microscopy | 1 - 3 - 2 |
| Ch 403 | Finishing Technology | 2 - 0 - 2 |
| TE 403 | Knitting Technology | 2 - 1 - 2 |
| TE 404 | Quality Control | 3 - 0 - 3 |
| Total | | 16 - 4 -17 |

JUNIOR YEAR — KNITTING OPTION

First Semester

| | | |
|--------|-----------------------------------|------------|
| E 301 | Masterpieces of World Literature | 3 - 0 - 3 |
| EE 318 | Elements of Circuits and Machines | 3 - 2 - 4 |
| TE 300 | Yarn Technology | 2 - 2 - 3 |
| BA 309 | Management Principles* | 3 - 0 - 3 |
| TE 311 | Knitting Technology | 2 - 4 - 4 |
| TE 313 | Knitting Design and Structure | 2 - 2 - 3 |
| Total | | 15 -10 -20 |

Second Semester

| | | |
|--------|--|------------|
| SS 340 | Sociology | 2 - 0 - 2 |
| EE 319 | Textile Applications of Machines and Control | 3 - 2 - 4 |
| TE 301 | Yarn Technology | 2 - 2 - 3 |
| BA 310 | Management Principles* | 3 - 0 - 3 |
| TE 312 | Knitting Technology | 2 - 4 - 4 |
| TE 314 | Knitting Design and Structure | 2 - 2 - 3 |
| Total | | 14 -10 -19 |

SENIOR YEAR — KNITTING OPTION

First Semester

| | | |
|--------|-------------------------------|-----------|
| E 401 | Technical Report Writing | 2 - 0 - 2 |
| TE 402 | Mill Engineering | 2 - 0 - 2 |
| BA 412 | Industrial Management | 3 - 0 - 3 |
| TE 400 | Physical Testing | 2 - 2 - 3 |
| Ch 400 | Dyeing Technology | 2 - 2 - 3 |
| M 221 | Statistics I | 3 - 0 - 3 |
| TE 406 | Knitting Technology | 1 - 2 - 2 |
| TE 413 | Knitting Design and Structure | 1 - 2 - 2 |
| Total | | 16 - 8-20 |

Second Semester

| | | |
|--------|-------------------------------|------------|
| E 402 | Effective Speaking | 2 - 0 - 2 |
| SS 412 | Applied Psychology | 3 - 0 - 3 |
| BA 413 | Industrial Management | 3 - 0 - 3 |
| TE 401 | Microscopy | 1 - 3 - 2 |
| Ch 403 | Finishing Technology | 2 - 0 - 2 |
| TE 404 | Quality Control | 3 - 0 - 3 |
| TE 414 | Knitting Design and Structure | 1 - 2 - 2 |
| TE 407 | Knitting Technology | 1 - 2 - 2 |
| TE 408 | Knitting Research | 1 - 2 - 2 |
| Total | | 17 - 9 -21 |

NEW BEDFORD INSTITUTE OF TECHNOLOGY

The Graduate School

GENERAL INFORMATION

The New Bedford Institute of Technology has been authorized by Act of the General Court of the Commonwealth of Massachusetts to confer the degrees of Master of Science in Textile Technology and Master of Science in Textile Chemistry.

These graduate programs are designed to allow able students to further their studies in a specialized area not possible in the undergraduate curriculum. In addition to taking advanced courses in his field of special interest, a candidate is required to investigate a specific problem such as might be encouraged in a research laboratory or textile plant and, under competent guidance, to carry it through from start to finish; finally, the candidate is required to evaluate and interpret his finding in his Master's thesis. This experience is deemed excellent preparation toward a more advanced degree or a position of supervisory capacity in textile or allied industries.

Admission

Following are the admission requirements and conditions necessary for eligibility to the Graduate School:

The applicant must have received a Bachelor of Science degree in an appropriate field from an institution recognized by the Institute.

An average grade of "B" or better in the undergraduate major is required.

All graduate candidates must designate a major field; no unclassified students will be admitted to the Institute.

Admission will be to full graduate standing only. No provisional or special students will be admitted to graduate courses.

Application Procedure

A student interested in graduate studies at the Institute should file an application with the Director of the Graduate School. Applications may be obtained from the Business Office of the Institute.

Applicants should also:

File an application by the first of May preceding the fall term in which the applicant wishes to enroll.

Send directly to the Director of the Graduate School two letters of reference from persons qualified to judge the applicant's ability to carry on graduate work.

Have official transcripts of all undergraduate records (and graduate, if any) sent to the Director of the Graduate School by the institutions previously attended. The content, credit hours and semesters related to each subject taken must also be included. This information must be received at the Institute no later than the first of May preceding the fall term in which the applicant wishes to enroll.

Expenses

Tuition, fees and other expenses for graduate students are the same as those listed for undergraduate courses on page 17 of this bulletin.

Credits

A minimum of thirty semester credits is required by students for a graduate degree. Credits towards the Master of Science degree may be obtained as follows:

At least ten credits must be acquired from subjects designated as graduate courses.

Ten credits will be allowed for graduate or undergraduate courses relating to the particular major and must be approved by the head of the department of that field in which the degree will be granted.

All candidates for the graduate degree must prepare a thesis representing an original investigation. The thesis will represent ten credits.

No more than six credits will be accepted from other institutions.

At least twenty-four credits must be obtained through residence study.

Requirements for Graduation

In order to be granted the Master of Science degree the candidate must have fulfilled the following requirements:

Satisfactorily completed the prescribed course of study leading to the degree in the field in which the student has enrolled.

Have obtained a minimum of thirty credits; twenty credits obtained in the prescribed courses, of which fourteen are to be earned in the field of specialization and six in any other related field.

Satisfactorily completed a thesis covering original research and approved by the head of the department concerned.

All compiled data must be satisfactorily analyzed and interpreted.

Have passed a comprehensive oral examination to satisfy the examining committee that the candidate possesses a reasonable mastery of knowledge in his major and minor fields and that this knowledge can be used with promptness and accuracy. This examination will not be held until all other requirements, except completing the course work of the last semester, are satisfied. The examination, however, must be taken not later than two weeks before the end of the semester in which the degree is to be awarded.

Have maintained a minimum standing of "B" in both the graduate and undergraduate subjects studied.

A reading knowledge of at least one approved foreign language.

Have a minimum of one year of academic residence.

Have the approval of his graduate adviser in consultation with the department in which he is enrolled for all subjects studied.

Must complete all graduate work within two calendar years.

GRADUATE COURSES OF STUDY

The Institute offers curricula leading to the Master of Science degrees in Textile Chemistry and Textile Technology. The graduate courses offer the candidate considerable latitude in the particular area of specialization within the field. All candidates are, however, expected to have their choice of courses approved by their faculty advisor so as to provide a well-balanced overall program to enable the successful candidate to adapt himself easily to industrial and graduate work.

Textile Chemistry

The following is a list of the courses acceptable for graduate credit toward the degree of Master of Science in Textile Chemistry:

- Physical Chemistry of Dyeing
- Physical Chemistry of Surface Active Agents
- Interpretation of Data
- Colloid Science
- Elementary Chemical Engineering
- Manufacturing and Processing of Synthetics

Survey of Current Textiles
Chemical Thermodynamics
Textile Microscopy
Textile Photomicrography

- *Statistics
- *Report Writing
- *Instrumental Analysis
- *Chemical Literature

Textile Technology

The following is a list of the courses acceptable for graduate credit toward the degree of Master of Science in Textile Technology:

Elements of Textile Technology
Structure of Textile Fibers
Physical Testing
Statistical Quality Control
*Knitting Technology
*Mechanics
*Calculus
*Differential Equations
*Organic Chemistry
*Advanced Chemistry
*Industrial Electronics
Photomicrography
Manufacturing and Processing of Synthetics
Fabric Design and Structure

Any further inquiries about the graduate programs at the Institute should be addressed to:

DIRECTOR OF GRADUATE SCHOOL
New Bedford Institute of Technology
Technology Center—New Bedford, Massachusetts

* Undergraduate courses.

NEW BEDFORD INSTITUTE OF TECHNOLOGY

Non-Degree Courses of Study

The primary function of the New Bedford Institute of Technology is to afford an opportunity, primarily to the people of Massachusetts, to further their education beyond the secondary level. It is for this reason that the Institute offers, aside from the degree programs, three-year diploma curricula in the field of textiles. Graduates of the diploma programs have found numerous opportunities in the textile and allied industries. For years management has recognized such graduates as an asset to certain functions within their organization, and in many cases even in supervisory capacities.

The Institute offers two diploma curricula in the field of textiles:

Chemistry, Dyeing and Finishing

The Chemistry, Dyeing and Finishing curriculum is designed to meet the needs of students seeking such positions as chemists or dyers, laboratory technicians and production supervisors. The course content is similar to that of the Textile Chemistry degree program but with less emphasis on the socio-humanistic studies and the basic sciences of mathematics and physics. The student acquires, however, a sufficient knowledge of organic, inorganic and analytical chemistry coupled with textile chemistry, dyeing and finishing to prepare him for positions of responsibility and trust.

Textile Manufacturing

The Textile Manufacturing curriculum is designed for students whose interest lie in such fields as testing, quality control, production or fabric design and structure. Students in the diploma program take all the textile courses offered in the Textile Technology degree curriculum. Greater emphasis is, however, given to the practical aspects of textile manufacturing rather than to the theoretical. Because of the limitation of time and the function of this program, students receive only a minimum of instruction in the basic sciences and the socio-humanistic studies.

Further information pertaining to non-degree courses may be secured from the Business Office or by addressing:

THE DIRECTOR OF ADMISSIONS
New Bedford Institute of Technology
Technology Center—New Bedford, Massachusetts

NEW BEDFORD INSTITUTE OF TECHNOLOGY

The Evening School

GENERAL INFORMATION

The Evening School is an integrated administrative unit of the New Bedford Institute of Technology. It is oriented to the need for supplying competently trained personnel to the professions and industries which the Institute serves. In addition, courses are offered to meet a growing need for the continuing education of the adult community.

The Evening School offers a wide range of courses in the fields of business administration, chemistry, engineering and textiles. Courses in the socio-humanistic studies are also offered. No degrees are granted by the Evening School, but some courses carry credits which may be transferred toward a Bachelor of Science degree in the day program.

Admission

Admission to the Evening School varies with the subject selected. Students taking evening courses for college credit must be graduates of a recognized secondary school. Applicants for credit in any course are required to present qualifying records. For all other programs, the only requirement, in general, is graduation from grammar school and the necessary professional or industrial experience.

Registration

Registration forms may be procured in advance at the Business Office. Registration is normally held during the second week of September for the Fall term and during the second week of December for the Spring term. No new registrations will be accepted after the first two weeks of classes, except with permission of the Director of Evening School and the instructor concerned. Students cannot apply for a transfer to a college credit program after the first two weeks of classes.

Expenses

Expenses charged for attendance at the Evening School are as follows:

Audited credit courses have a tuition charge of \$5.00 per credit hour for all residents and non-residents of New Bedford or the Commonwealth of Massachusetts.

A \$9.00 fee per credit hour is charged to all students enrolled in a course for college credit. Out-of-state students

will be charged \$11.00 per credit hour if college credit is desired.

A \$2.00 laboratory fee is required of students enrolled in Chemistry and Machine Shop courses.

No refunds for evening school classes will be made after two weeks from the date of enrollment in any class. An application for refund must be made by the student.

Attendance

Students must attend 70% of classes held and complete prescribed assignments in order to receive a certificate for the subject. Students in college-credit courses must be present for 80% of scheduled classes.

The academic year consists of two 12 week semesters in the Evening School. The first semester begins at the end of September and extends to the middle of December. The second semester starts during the first week of January and is completed about the end of March.

The sessions per week and the semesters required to complete a subject are outlined in a separate bulletin. A session consists of one and one-half hours. In most courses, one session is given in one night; however, due to the nature of the course, in some cases two sessions (three hours) are completed in one night.

COURSES OF STUDY

Information on the credit and non-credit courses of study offered by the New Bedford Institute of Technology Evening School are outlined in a separate bulletin obtainable from the Business Office of the Institute or by addressing:

DIRECTOR OF EVENING SCHOOL

New Bedford Institute of Technology

Technology Center—New Bedford, Massachusetts

NEW BEDFORD INSTITUTE OF TECHNOLOGY

Description of Courses

Course descriptions are arranged alphabetically by course numbers. Each number is composed of a code, which signifies the department offering the course, and a numerical value ranging anywhere between 100 and 499, inclusive. Courses bearing a number from 100 to 199, inclusive, are normally offered to freshman; those from 200 to 299, sophomores; 300 to 399, juniors; 400 to 499, seniors. Following each course number and title, the number of lecture recitations, laboratory hours and the total credit hours for a semester are given a numerical value. It will be found, however, that the lecture and laboratory hours are combined for all courses offered in the Textile Design and Fashion curriculum.

COURSE CODE TO DEPARTMENTS

| | |
|------------------------------|--------|
| Business Administration | BA |
| Electrical Engineering | EE |
| English and Modern Languages | E or L |
| Mathematics | M |
| Mechanical Engineering | ME |
| Physics | P |
| Social Science | SS |
| Textiles | |
| Textile Design and Fashion | TD |
| Textile Engineering | TE |

Examples of the above coding systems are as follows:

P-102—*Engineering Physics*—(3-2-4). The letter "P" indicates the Department of Physics; "102" that the subject is offered in the Freshman year; (3-2-4) that three lecture recitations, two laboratory hours and four credits are given.

TE-300, 301—*Yarn Technology*—(2-2-3). This course in Yarn Technology has been given two course numbers indicating that it is taught for two semesters. The code "TE" represents the Department of Textile Engineering; "300, 301" shows that the course is normally offered in the Junior year; (2-2-3) means that two lecture hours, two laboratory hours and three credits are given for each semester.

DEPARTMENT OF BUSINESS ADMINISTRATION

BA 101—*Accounting Principles*—(3-2-4). This course covers the basic principles and procedures in the development of the accounting cycle with emphasis on use of accounting knowledge as a fundamental aid to management and marketing.

BA 102—*Accounting Principles*—(3-2-4). Introduction to partnership and corporation accounting. Consideration is given to the effects of automation in accounting procedures.

Prerequisite: BA 101

BA 103—*Survey of Business Practices*—(2-0-2). A course designed to introduce the major areas of business activity with selection of a field of interest as a specific objective for the student. The meaning, scope and place of business is economic organization.

BA 104—*Survey of Business Practices*—(2-0-2). A study of the types of business organization. Consideration is given to the viewpoint of the consumer, business investments, insurance, the management of income, travel and banking services.

Prerequisite: BA 103

BA 201—*Intermediate Accounting*—(3-0-3). Review of the nature and presentation of basic financial reports and records. A detailed analysis of profit and loss accounts and the effect on the balance sheet equation. Consideration of errors and corrections required by the most reputable standards in current professional practices.

Prerequisite: BA 102

BA 202—*Advanced Accounting*—(3-0-3). A detailed study of procedures in partnership and corporation accounting. Installment and consignment sales, consolidations and fiduciary and budgetary accounting.

Prerequisite: BA 201

BA 205—*Money and Banking*—(3-0-3). An analysis of our commercial banking system, Federal Reserve, the United States Treasury and other financial institutions. The relationship between variations of the money supply and national income.

BA 206, 207—*Marketing Principles*—(3-0-3). The study of the processes and institutions involved in the distribution of commodities. Wholesaling, retailing, and other aspects of distribution.

BA 209, 210—*Business Communications*—(2-0-2). The fundamental principles of effective business writing with emphasis on clearness, conciseness, concreteness, character, and courtesy. Practical problems and practice in the preparation of inquiries and replies, notices, announcements, invitations, orders, acknowledgments, human-interest messages,

the letter of application, effective sales letters, adjustments, credits and collections.

Prerequisite: E-102

BA 301, 302—*Cost Accounting*—(3-0-3). A study of cost methods used in manufacturing, distribution and service operations. This course covers job order, process and standard cost systems. Costs of materials and labor including inventory and payroll records.

Prerequisite: BA 202

BA 303—*Business Law*—(3-0-3). Study of legal principles and laws applicable to business. Courts and court procedures. Sales, insurance, contracts, agency, common carriers, partnerships. Text and case method are used.

BA 304—*Business Law*—(3-0-3). Laws pertinent to corporations, property sales, negotiable instruments and bankruptcy.

Prerequisite: BA 303

BA 305—*Advertising and Selling*—(3-0-3). A study of the principal forms of advertising. Practice in the planning of advertising campaigns. Methods of selling and their application to specific cases.

BA 306—*Retail Store Management*—(3-0-3). The management of small as well as department, chain and mail order stores. Location and layout. Operational activities including receiving, stock-keeping, delivery, credit, and returns.

BA 308—*Modern Wholesaling*—(3-0-3). The fundamentals of wholesaling. A detailed study of industrial, co-operative and service wholesalers, special wholesalers, agents, local and sectional wholesalers, brands and lines of goods. Competitive aspects of the trade.

BA 309, 310—*Management Principles*—(3-0-3). A study of the relationships underlying production management. Includes problems of production control, purchasing, location, physical facilities and personnel.

BA 401, 402—*Auditing*—(3-0-3). Procedures and practices in auditing programs. Legal responsibilities of the auditor. Audit report writing.

Prerequisite: BA 202

BA 403, 404—*Income Tax Accounting*—(3-0-3). A study of the Internal Revenue Code as it affects individuals and partnerships and corporations. Practical application is also given through the preparation of returns for all types of taxpayers.

BA 405—*Personnel Administration*—(3-0-3). Methods of recruiting, selecting and training personnel. Consideration of employee services, union-management relations, handling grievances. Cases and problems are utilized.

BA 406—*Insurance Fundamentals*—(2-0-2). The fundamental principles of insurance, economic and social aspects. A study of the most common forms: Life, property, casualty and suretyship.

BA 407—*Seminar in Current Business Problems*—(2-0-2). Survey of current economic conditions in the world, and particularly in the United States, with specific consideration of the significance of these conditions to regional business interests. Research projects. Meetings with guest consultants recognized as authorities in the economic areas affected.

BA 408, 409—*Market Research*—(3-0-3). A study of techniques of market research and principles applied to marketing problems. Field work and practice in making market surveys.

BA 410—*Taxation*—(3-0-3). A course designed to acquaint marketing and management majors with the basic tax problems affecting the individual and the business organizations with which he may become associated. In addition to income taxes, sales and excise taxes as well as real and personal property taxation are treated.

BA 411—*Government Regulations of Business*—(3-0-3). A study of Federal and State laws pertinent to specific operations in business procedures. History of the trends in government regulation of business with appraisal of their practical significance in the economic life of the nation as well as business organizations.

BA 412, 413—*Industrial Management*—(3-0-3). Investigation and choice of products, plant location and layout, administrative organization and cooperation, departmental duties and relationships, expanding and contracting production in accord with economic conditions.

DEPARTMENT OF CHEMISTRY

Ch 101, 102—*Introductory Chemistry*—(3-2-4). An introductory course in Chemistry required for all students in the Textile Technology curriculum. It comprises a general survey of Chemistry, its basic laws and theories, a general study of the common elements both metallic and non-metallic and a study of the use and application of chemistry to daily life. In the laboratory work which accompanies this course, the student performs experiments selected with a view to enabling him to learn to draw correct conclusions from definitive happenings. It also enables him to acquire a certain manipulative technique in using the basic chemical tools.

Ch 111—*College Chemistry*—(3-2-5)*, (3-6-6)†. This course is required of those students matriculating for the Bachelor of Science degree in Chemistry or Engineering. The course comprises of a thorough study of basic chemical facts: The study of matter, atomic structure and its applications to chemical reactions, the states of matter, solutions and equilibrium; the elements of Period III and their compounds are studied in greater detail in order to show more clearly the relation between atomic structure and chemical properties. The laboratory periods are designed to run concurrently with the lectures.

Ch 112—*College Chemistry*—(3-2-4)*, (3-0-3)†. A continuation of Ch 111. Second Semester.

Prerequisite: Ch 111

Ch 113—*Qualitative Analysis*—(2-4-3). This course enables the student to tell what inorganic, and a few organic substances are present in a compound. The latest semi-micro technique of analysis is used. In the laboratory the student applies what he has studied in the analysis of both "known" and "unknown" materials. Problem work dealing with equilibrium and the other important phases of qualitative analysis is stressed.

Prerequisite: Ch 111

Ch 203—*Introductory Dyeing*—(3-2-4). A course especially designed for the Textile Design and Fashion students. Introduction to laboratory procedures. Preparation of cotton, rayon and nylon fabrics for dyeing. Preparation and application of various dyes. Introduction to screen printing.

Ch 211—*Quantitative Analysis*—(2-4-3). The lectures in this course comprise a thorough and complete discussion of the theories of solutions, a quantitative approach to oxidation-reduction reactions (redox reactions) and a study of some precipitation methods. The laboratory work is an application of the principles discussed in the lectures. It consists of the calibration of the volumetric ware used and the analysis of materials by neutralization, oxidation-reduction and precipitation methods.

Prerequisite: Ch 113

Ch 212—*Quantitative Analysis*—(2-4-3). This course is a continuation of Ch 211 and consists of a study of the gravimetric methods of analysis.

Prerequisite: Ch 211

Ch 221—*Introductory Textile Chemistry*—(2-4-3). This course consists of a study of the physical and chemical constitution of the textile fibers, both natural and synthetic; a study of the physical and chemical changes that result from the action of various inorganic and organic

* For all engineering students.

† For all chemistry students.

agents on the fibers; a study of the methods of application and the effects of the various classes of dyes on the fibers.

Prerequisite: Ch 112

Ch 222—*Dyeing*—(2-4-3). This course consists of a study of preparation of the textile fibers for dyeing; a study of the application of the various classes of dyestuffs to the textile fibers.

Prerequisite: Ch 221

Ch 231, 232—*Organic Chemistry*—(3-4-4). A systematic study of the chemistry of the compounds of carbon as presented by the more prominent authorities in the organic field. Proper laboratory practice acquaints the student with the set-up of organic laboratory experiments and the synthesis, identification and proper handling of the compounds.

Prerequisite: Ch 113

Ch 311, 312—*Instrumental Analysis*—(2-4-3). This is primarily a laboratory course in which the student studies the analysis of various materials by means of analytical instruments. He studies the theory involved in the use of optical (colorimeters, abridged spectrophotometers, spectrophotometers) instruments, electrical (pH, potentiometry, electroanalysis) instruments and others. The laboratory work enables the student to make use of this theoretical knowledge in using the instruments.

Prerequisite: Ch 212, 232

Ch 321—*Advanced Dyeing*—(1-6-3). This course is taken concurrently with Ch 342 in order that the special attention necessary in preparing ground shade for discharge printing and the details of over-dyeing resist printed fabrics may be better understood by the student. The theory of the selection of dyes for those purposes and the need for the addition of special chemical agents to the dye-baths is studied in detail.

Prerequisite: Ch 222

Ch 331—*Advanced Organic Chemistry*—(3-6-5). The study of more complex organic compounds and reaction mechanisms, with emphasis being placed on dyestuffs and their intermediates.

Prerequisite: Ch 232

Ch 332—*Advanced Organic Chemistry*—(3-4-4). Study of the laboratory practice of synthetic organic chemistry, with particular emphasis on the methods of isolating and purifying organic compounds.

Prerequisite: Ch 232

Ch 341—*Textile Printing*—(2-4-3). In this course the student is introduced to the methods of textile printing (roller, screen, hand block, etc.) and the basic styles of printing (direct, discharge and resist). The preparation of print pastes for direct style printing of direct, basic, mordant insoluble azo, vat, leuco vat dyes, resin bonded pigments and

oxidation colors is considered in detail, especially the complex chemical considerations of many of these print color preparations. All prepared color pastes are roller printed and the prints finished off by the students.

Ch 342—*Textile Printing*—(2-4-3). This course is taken concurrently with Ch 321. The more complex styles of printing, discharge and resist, are covered in detail. The preparation of white and colored print pastes for all classes of dyed backgrounds is considered. All print pastes are screen printed.

Prerequisite: Ch 341

Ch 351—*Bacteriology*—(2-6-4). An introductory course in bacteriology. The lectures present the fundamental concepts of this science and explains to the student bacterial classification and the significance of pathogenic and non-pathogenic micro-organisms. The laboratory work includes: preparation of culture media; sterilization of equipment and cultures; aseptic preparation and handling of pure cultures and simple and differential staining.

Prerequisite: Ch 112

Ch 352—*Microbiology*—(2-6-4). This course includes the study of various micro-organisms and their importance to man and his textile world. Sterilization, disinfection, fumigation, staining, and methods of studying the action of molds and bacteria on textile fabrics are studied. Laboratory work includes the preparation and sterilization of the specific culture media, the staining and microscopic observation of the specific bacteria involved, and mildew and rot-proofing tests on textile fabrics.

Prerequisite: Ch 351

Ch 360—*Chemical Literature*—(2-0-2). The course is designed to familiarize the student with the numerous journals and source books in chemistry. It requires a facility in reading German or French. The student will be expected to finish and hand in a report on some phase of chemical literature chosen by the instructor, before credit will be given.

Ch 365—*Chemical Metallurgy*—(2-0-2). A lecture course on the various processes of working metals and separating them from the ores.

Prerequisite: Ch 112

Ch 381—*General Biological Science*—(2-0-2). The art and sciences of nutrition. Digestion and metabolism. Nutrition and its place in the every day world. Classification and functions of foods. Bacteria, health and sanitation. Advances in man's ability to harness microscopic living creatures in the service of mankind. Antibiotics, drugs and chemicals—the products of biochemical engineering. A survey course in microbiology.

Ch 382—*History of Chemistry*—(2-0-2). A survey course of the art and science of chemistry from prehistoric times to the present day.

Ch 393—*Biochemistry*—(2-3-3). A study of the nature of the chemical processes in animals and of the metabolism of foods. The study includes the chemistry of proteins, carbohydrates and fats. In the laboratory the student deals with the more important biological substances and certain body fluids (blood and urine).

Prerequisite: Ch 232

Ch 400—*Dyeing Technology*—(2-2-3). This course is designed to acquaint the student enrolled in Textile Engineering and Textile Technology with the fundamental properties of the several classes of dyes as related to their ability to color textile fibers and to acquaint him with terms and practices of their use in the industry.

Prerequisite: Ch 102

Ch 401—*Colloid Chemistry*—(2-3-3). An introduction to the colloidal state of matter, covering a consideration of the characteristics and behavior of colloidal substance; methods of preparing colloidal substances; a study of natural colloidal substances and a special study of the application of colloidal behavior to the chemistry of textiles, dyeing and finishing.

In the laboratory the student observes the fundamental characteristics and behavior of materials in the colloidal state; learns how to prepare colloidal substances and applies this knowledge to selected problems dealing with textile chemistry, dyeing and finishing.

Prerequisite: Ch 212, P 202

Ch 402—*Structure of Textile Fibers*—(2-0-2). This is a lecture course for advanced students in Textile Engineering and Textile Technology. The course includes a discussion of the fundamentals of fiber polymer structure and its relation to their physical properties and the manufacture of man-made fibers starting with the raw materials up to their emergence as fibers.

Prerequisite: Ch 201

Ch 402—*Finishing Technology*—(2-0-2). This is a course set up for the students enrolled in the Textile Design and Fashion Course and deals with the application and end use of the various classes of textile finishes.

Prerequisite: Ch 104

Ch 411, 412—*Physical Chemistry*—(4-3-5). A study of the fundamental laws and theories of chemistry and of the various factors which modify and change the reactions and properties of chemical substances. The laboratory work is chosen to illustrate the principles studied. The problems given are a very important part of the course and quantitatively exemplify these principles.

Prerequisites: Ch 212, M 204, P 202

Ch 421—*Advanced Dyeing*—(1-3-2). The theory and practice of color matching are principally emphasized in this course. The student is taught the proper methods of obtaining a given shade by using a combination of several dyes. The testing of various classes of dyestuffs for their coloring powers and money value is included. The characteristics of the various dyestuff combinations are considered.

The more important AATCC tests procedures are also carried out.
Prerequisite: Ch 321

Ch 431—*Chemistry of Textile Fibers*—(3-3-4). A course emphasizing: the relationship between the chemical structure and physical properties of fibers; the nature of the chemical reactions which produce degradation of fibers; the production of synthetic fibers. The short laboratory period is devoted to tests that serve to identify the types of fibers and their degradation products.

Prerequisite: Ch 232

Ch 441—*Industrial Chemical Analysis*—(2-6-4). The student learns how to determine the properties, and to analyze many of the chemical materials used in the textile industry. He will analyze soap, bleaching agents, caustic soda, etc. He is expected to apply the knowledge and experience acquired during the previous courses in Chemistry.

Prerequisite: Ch 312

Ch 442—*Industrial Chemical Analysis*—(2-6-5). This course, a continuation of Ch 441, teaches the student how to analyze coal, oil, water, certain types of organic materials such as chemical fungicides and finishing compounds.

Prerequisite: Ch 441

Ch 451—*Textile Finishing*—(1-6-3). This course is restricted to students in the Textile Chemistry Course and deals with the application and end uses of the various classes of textile finishes and the procedures used in the application of these finishes to fabrics.

Prerequisite: Ch 321

Ch 452—*Textile Finishing*—(1-6-3). This course, a continuation of Ch 451, gives particular attention to special finishes, such as water repellent, fire retardant and crush resistant effects. This course is supplemented by field trips to various plants, bleacheries, dyehouses and textile printing plants.

Prerequisite: Ch 342

Ch 461—*Organic Qualitative Analysis*—(2-4-3). In the first semester the student learns the systematic methods for the classification and identification of organic compounds (qualitative).

Prerequisite: Ch 332

Ch 462—*Organic Quantitative Analysis*—(2-4-3). During the second semester the student determines, by so-called ultimate analysis, the quantity of carbon, hydrogen, oxygen, halogens, and other substances usually present in organic compounds (quantitative).

Prerequisite: Ch 461

Ch 481—*The Chemistry of Food and Nutrition*—(2-3-3). The student learns of man's needs for the various constituents of foods. He also learns how to analyze foods and how to determine the nature and extent of food adulteration.

Prerequisite: Ch 232

Ch 491—*Industrial Chemistry*—(3-0-3). The student undertakes a detailed study of the more important chemical industries. Field trips to various plants will be arranged with a view to crystallizing what the student has learned and detailed reports will be expected.

Prerequisite: Ch 232

DEPARTMENT OF ELECTRICAL ENGINEERING

EE 201—*Electric and Magnetic Circuits*—(3-0-3). Introductory study of basic electric and magnetic circuits and method of network analysis including loop and nodal methods, Thevenin's and Norton's theorems, and graphical methods.

Prerequisite: M 201 to be taken concurrently.

EE 202—*Elements of Electrical Engineering*—(4-0-4). Fundamentals of electrical engineering including electrostatics, magnetostatics, structure and behavior of semi-conductors and electron ballistics.

Prerequisite: M 201 to be taken concurrently.

EE 203—*Electric Circuits*—(3-2-4). Includes circuit theory of d.c. and sinusoidal quantities, application of network theorems, polyphase circuits and an introduction to electrical measurements. Problem sessions and laboratory accompany regular assignments.

Prerequisites: M 201 and EE 202 (or EE 201).

EE 302—*Electric and Magnetic Fields*—(3-0-3). A mathematical treatment of electric and magnetic fields with spherical, cylindrical and plane boundaries. Flux mapping.

Prerequisite: M 202

EE 304—*Electronics I*—(3-2-4). Analysis of basic vacuum tube circuits and semi-conductor devices.

Prerequisite: EE 203

EE 309—*Network Analysis*—(3-0-3). A study of electric networks including network topology, formulation of equations, duality, solution

of equations by determinants, time and frequency domain, impedance and admittance functions. Polo and zero approach to steady-state analysis. Two-terminal and four-terminal networks.

Prerequisites: EE 203 and M 202

EE 310—*Electric Machinery*—(3-2-4). Course including study of electric rotating machines and their control, transformers, metadynes and aircraft applications.

Prerequisite EE 203 or consent of Department Chairman.

EE 313—*Electric Circuits and Machines I*—(3-0-3). Course offered to non-engineering majors emphasizing operating principles rather than detailed mathematical theory. Topics include basic d.c. circuits, electromagnetic principles, d.c. generators and motors, and motor control.

Prerequisite: M 102

EE 314—*Electric Circuits and Machines II*—(3-0-3). Continuation of EE 313 including basic single-phase circuits, three-phase circuits, transformers, a.c. generators and motors, and motor control. Introduction to electronics.

Prerequisite: EE 313

EE 315—*Electrical Engineering I*—(3-2-4). Offered to non-electrical engineering students. Topics discussed include d.c. circuits and methods of analysis, electro-magnetic fields, d.c. machines and their control.

Prerequisites: M 201 and P 201

EE 316—*Electrical Engineering II*—(3-2-4). Continuation of EE 315 including single-phase and polyphase circuits, resonance and anti-resonance, transformers, a.c. machines and their control.

Prerequisites: EE 315, M 202

EE 317—*Electromagnetics*—(3-0-3). An analytical approach to static fields with introduction to time-varying field problems using vector analysis. Boundary-value problems. Divergence Theorem, Poisson and Laplace equations, and the wave equation.

Prerequisites: P 201 (M 301 may be taken concurrently).

EE 318—*Elements of Circuits and Machines*—(3-2-4). Introduction to the fundamentals of electric circuits and machines for non-electrical majors, including circuit theory, methods of circuit analysis, essentials of electric machinery, and basic electric and electronic controls.

Prerequisite: M 102

EE 319—*Textile Application of Machines and Control*—(3-2-4). D.C. and A.C. motor control with emphasis on textile application. Also includes study of various electronic devices used in the industry.

Prerequisite: EE 318

EE 405—*Electronics II*—(3-2-4). Course includes a study of the application of vacuum tubes and semi-conductor devices to perform specific functions in communication systems including modulation, amplification, and oscillation; and factors affecting frequency response; input and output impedances.

Prerequisite: EE 304

EE 406—*Theory of Electrical Measurement*—(2-2-3). Mathematical methods of evaluation of experimental data and determination of experimental error. Includes a study of instruments and circuits designed to perform specific electrical measurements. Laboratory assignments.

Prerequisite: EE 304 or equivalent.

EE 409—*System Dynamics*—(3-0-3). Elective course on system dynamics including such topics as mechanical systems, hydraulic and pneumatic systems, and electric and electronic systems. Electric Actuators, electronic amplifiers, magnetic amplifiers, dynamo-electric and transducers. Techniques for determining the response of linear control systems.

Prerequisites: EE 301, EE 304 and EE 310

EE 410—*Filter and Transmission Circuits*—(3-0-3). Includes four-terminal ladder and lattice filter networks and realizability. Wave propagation along transmission lines, use of Smith Chart and transient conditions of transmission lines.

Prerequisite: EE 309

EE 413—*Servomechanisms*—(3-2-4). Introduction to feedback control systems, theory and application of servomechanisms to control problems. Root-locus method, Nyquist criterion and their applications. Servomechanism equilization and design of equalizers.

Prerequisites: EE 310 and EE 309

EE 415—*Advanced Electric Machinery*—(3-0-3). Generalized analysis of machines used for energy control and conversion using matrix transformations, etc. Application of methods of analysis to systems containing electric machines.

Prerequisites: EE 310, M 302 or EE 418

EE 416—*Transistor Circuits*—(3-0-3). Introduction to transistor theory. Mathematical analysis of transistor circuit configuration and equivalent circuits.

Prerequisites: EE 304, M 301

EE 417—*Transient Analysis*—(3-0-3). Transient analysis by classical method and modern operational methods including the Laplace Transformation of simple circuits, coupled circuits, and electromechanical systems. Forcing functions. Steady-state solutions by transformation methods.

Prerequisites: M 301, EE 203 or equivalent.

EE 418—*Analysis of Electrical Engineering Problems*—(3-0-3). Methods of analysis of selected topics in electrical engineering using Fourier and Laplace Transformations, Bessel functions, etc.

Prerequisite: M 301, open only to seniors.

EE 419—*Introductory Electronics*—(3-2-4). A course for non-electrical engineering majors consisting of a study of basic electron circuit components and electron tubes. Performance of vacuum tubes as rectifiers, amplifiers, oscillators and relays.

Prerequisite: EE 316

EE 420—*Industrial Electronics*—(3-2-4). Study of vacuum tube applications to industrial control. Performance of electronic controls in instrumentation, regulation and relaying. Functions and limitations of commercial electronic control devices including metadyne control principles and photoelectric relays.

Prerequisite: EE 419

EE 421—*Electric Power Systems*—(3-0-3). Power system parameters, steady-state calculations, fault calculations and transients stability. Theory of symmetrical components with application to the operation of electric power systems under unbalanced and steady-state conditions, components of instantaneous currents and voltages and their use in transient problems. Characteristics of synchronous plants.

Prerequisites: EE 310, EE 317

EE 422—*Introduction to Information Theory*—(3-0-3). Noise, its kinds and equivalent noise circuits. Basic concepts of probability theory as applied to communications and information theory. Random processes, power spectral density. Mathematical definition of information theory and related topics.

Prerequisites: EE 304, EE 309

EE 423—*Elements of Industrial Electronics*—(3-2-4). Essentially the material of EE 419 and EE 420.

Prerequisites: EE 203 and M 202

EE 424—*Introduction to Computational Circuits*—(3-0-0). Boolean algebra. Theory and design of special digital computing circuits, including counters, differentiating and integrating circuits, and other basic arithmetic operations and coding.

Prerequisites: EE 304 and EE 309

EE 425—*Wave Forming Circuits*—(3-0-3). Theory and design of generators and shapers of non-sinusoidal waves including clippers, clippers, stretchers, selecting circuits, limiters, peakers and ringing circuits.

Prerequisites: EE 304 and EE 309

DEPARTMENT OF ENGLISH AND MODERN LANGUAGES

E 101, 102—*English Composition*—(3-0-3). In the first semester, the aim of the course is to introduce the student to the principal uses of language. Emphasis is placed on the ability to speak and write clearly. The fundamentals of grammar, sentence structure, punctuation, paragraph structure, proper organization of materials and problems of style are considered. In addition, much attention is given to the problem of straight and logical thinking, with frequent writing exercises and supplementary readings.

In the second semester, the student is introduced to imaginative literature and literary theory. The aim is to equip the student for his lifetime reading by guiding him through a series of reading experiences and by giving him a clearer understanding of the fact that novelists, poets and playwrights say important things about human life; of how they say them, and of the differences between literary art and other forms of discourse. Frequent exercises in writing will be required for review of principles of composition.

E 301—*Masterpieces of World Literature*—(3-0-3). The course covers a study of selected classics from the Golden Age of Greece to the Twentieth Century. Emphasis is placed upon some of the fundamental ideas and literary forms that are an important part of the heritage of Western Civilization.

E 302—*Survey of American Literature*—(3-0-3). A survey of selected American writers from the Colonial Period to the present. Emphasis is placed upon the development of certain literary forms and some of the ideas that have been important in the evolution of American thought.

E 401—*Technical Report Writing*—(2-0-2). This course is designed to meet the requirements of technical reporting. Its approach is a flexible one; for this reason it is concerned merely with basic principles relating to structure, organization and effective communication. No attempt is made to establish any standardized forms in technical report writing.

E 402—*Public Speaking*—(2-0-2). Modern society demands that a college graduate speak effectively and clearly. This course is designed to meet these demands made upon the college graduate. The course disciplines the student in the criterion of speech construction and delivery. Students have ample opportunity to address groups and thereby receive the benefit of constructive criticism.

L 201, 202—*French I, II*—(3-0-3). A course in the fundamentals of the French language. Grammar, composition, and reading of French prose.

L 211, 212—*German I, II*—(3-0-3). An elementary course in the German language. Covers grammar, composition, and reading of German prose.

L 301—*French III*—(3-0-3). A survey course of French literature of the Middle Ages and Renaissance. Conducted in French.

Prerequisite: L 202 or consent of the department head.

L 302—*French IV*—(3-0-3). Surveys literature of the Classical Period to 1850. Conducted in French.

Prerequisite: L 301 or consent of the department head.

L 303—*French V*—(3-0-3). Reading and writing of French scientific and technical material and the acquisition of an extensive scientific vocabulary. This course may be substituted for L 302.

Prerequisites: L 201, L 202 or consent of the department head.

L 313—*German III*—(3-0-3). Reading and writing of German scientific and technical material and the acquisition of an extensive scientific vocabulary. This course may be substituted for L 315.

Prerequisites: L 211, L 212 or consent of the department head.

L 314—*German IV*—(3-0-3). A survey of German literature of the nineteenth century. Conducted primarily in German.

Prerequisites: L 211, L 212 or consent of the department head.

L 315—*German V*—(3-0-3). Surveys German literature of the twentieth century. Conducted primarily in German.

Prerequisite: L 314 or consent of the department head.

DEPARTMENT OF MATHEMATICS

M 100A—*Introductory Mathematics*—(3-0-3). A survey course in mathematics suited to the needs of the student who does not intend to take further courses in this area. Included are a brief review of the elements of algebra and select topics in college algebra.

M 100B—*Introductory Mathematics*—(3-0-3). A continuation of the concepts developed in M 100A including selected topics in trigonometry and analytic geometry.

Prerequisite: M 100A

M 101—*College Math I*—(5-0-5). This course includes algebraic operations, exponents and radicals, functions and their graphs, trigonometric functions, and their graphs, properties of vectors, variation, binomial theorem.

M 102—*College Math II*—(5-0-5). A continuation of M 101. Logarithms, the oblique triangle, the j-operator, linear equations and determinants, quadratic equation and equations of higher degree, the straight

line, the conic sections, elements of solid analytic geometry, elements of differential and integral calculus.

Prerequisite: M 101

M 121—*Business Math I*—(3-0-3). A study of averages (moving and progressive), taxes, wages payments, bank discount, installment buying, business ownership, retailing, stocks, bonds, insurance (Personal—Business—Fire—Health—Accident), annuities and sinking funds.

M 122—*Business Math II*—(3-0-3). A continuation of M 121, involving a study of transactions in corporate securities, advanced problems in retailing, reverse operations in simple interest, reverse operations in bank discount, amortization and business graphs.

M 201—*Differential Calculus*—(3-0-3). Following a brief review of the basic concepts, all the fundamental differential formulas are developed. Emphasis is placed on the application of the derivative. A further study is made of continuous functions, the differential, approximate formulas, hyperbolic functions.

Prerequisite: M 102

M 202—*Integral Calculus*—(3-0-3). After the standard formulas have been developed, further study is made of integration by substitution and integration of rational fractions. Emphasis is placed on area, volume, length of curve, centroids, moments of inertia, fluid pressure and work.

Prerequisite: M 201

M 221—*Statistics I*—(3-0-3). A course to acquaint the students with the basic concepts in statistics. A study is made of charts, diagrams, graphs, basic measures of central tendency and variability, special averages, frequency distributions, statistics of frequency distributions, uniform scales, moments, the normal curve. A project in educational research is conducted by the class.

Prerequisite: M 100B

M 222—*Statistics II*—(3-0-3). A continuation of M 221, involving a study of curve fitting, inferences from sample means, regression and correlation, the chi-square distribution and the binominal and related distributions.

Prerequisite: M 221

M 301—*Differential Equations*—(3-0-3). A study of ordinary differential equations of the first and higher order with special emphasis on application to mechanics and electrical circuits. Also included are series solutions of differential equations and an introduction to the Laplace Transformation.

Prerequisite: M 202

M 302—*Selected Topics in Advanced Calculus*—(3-0-3). An introduction to vector methods involving the elements of vector algebra and vector calculus with applications to mechanics, hydrodynamics and electromagnetism. The latter portion is devoted to certain mathematical methods as employed in physics and engineering relating to potential, conservative fields, heat flow, vibrations, etc.

Prerequisite: M 301

DEPARTMENT OF MECHANICAL ENGINEERING

ME 111—*Engineering Drawing*—(0-6-3). This course is concerned with the basic principles of engineering drawing, freehand lettering, instrumental and freehand drawing, theory of orthographic projection, multi-view drawing, sectional views, auxiliary views and isometrics.

ME 112—*Engineering Drawing*—(0-6-3). A continuation of ME 111, covering obliques, perspectives, intersections and developments as well as dimensioning, fits and tolerances, screw fasteners, working drawings, charts and graphs.

Prerequisite: ME 111

ME 121—*Engineering Drawing*—(0-4-2). A course similar to ME 111 and especially designed for the students in the Textile Chemistry or Textile Technology curricula.

ME 122—*Engineering Drawing*—(0-4-2). This course in Engineering Drawing is a continuation of ME 121 and similar to ME 112.

Prerequisite: ME 121

ME 131—*Engineering Drawing*—(0-6-3). Similar to ME 111 and ME 112 for students in the Electrical and Textile Engineering programs.

ME 201—*Manufacturing Processes*—(2-0-2). A study of the processes and equipment involved in machining materials. Included are turning machines, boring, milling, grinding and thread cutting.

ME 201L—*Manufacturing Processes Laboratory*—(0-3-1). Instruction in the use of the basic machine tools of industry. Emphasis is placed on the capabilities and limitations of the machines. Various operations involving the use of the engine lathe, drilling and polishing machines are also included.

Prerequisite: Simultaneous registration in ME 212.

ME 202—*Manufacturing Processes*—(2-0-2). A continuation of ME 201, covering gears and gear manufacturing, casting, hot and cold working processes, welding and allied processes.

Prerequisite: ME 201

ME 202L—*Manufacturing Processes Laboratory*—(0-3-1). A continuation of machining processes in ME 201L with instruction in the use of the milling machine and heat treating techniques.

Prerequisite: Simultaneous registration in ME 213.

ME 211—*Descriptive Geometry*—(2-3-3). A course which integrates the theory and practice of descriptive geometry as applied to engineering problems in the field. The course covers such topics as point, line and plane relations, intersections, perpendicularity, mining and civil engineering problems, revolutions, vectors, tangencies, developments and conics.

Prerequisite: ME 112

ME 214—*Mechanics (Statics)*—(3-0-3). An introductory course in mechanics dealing with the statics of particles, statics of rigid bodies in two and three dimensions, centroids and center of gravity, analysis of structures, forces in beams, friction, moments of inertia and methods of virtual work.

Prerequisite: P 101

ME 217—*Engineering Metallurgy*—(2-0-2). The course presents the fundamentals of metal structure, factors affecting engineering properties, static properties of metallic material, dynamic properties of metallic materials, corrosion and corrosion testing and extraction of metals from their ores.

ME 218—*Engineering Metallurgy*—(2-2-3). A continuation of ME 217 which includes a study of phase diagrams and simple alloy systems, heat treatment, light alloys, the constitution of steel, cast iron, machinability and wear resistance of metals, and a series of several laboratory assignments to supplement topics.

ME 310—*Mechanics (Dynamics)*—(3-0-3). An introduction to the kinematics and kinetics of particles, force, mass and acceleration, work and energy and impulse and momentum. Deals also with the kinematics and kinetics of rigid bodies, dynamic equilibrium, work and energy, impulse and momentum and mechanical vibrations.

Prerequisite: P 102

ME 313—*Strength of Materials*—(3-2-4). Especially designed for students in the Electrical and Textile Engineering curricula. An abridgement of ME 314 is supplemented by approximately eight experiments in the materials testing laboratory.

Prerequisite: ME 214

ME 314—*Strength of Materials*—(3-0-3). A study dealing with elementary stresses and strains, stresses due to change of temperature, combined stresses, stresses in riveted connections, strength and deflection of beams, longitudinal shears in beams, statically indeterminate beams, columns, simple torsion and beams of two materials.

Prerequisite: ME 214

ME 314L—*Strength of Materials Laboratory*—(0-3-1). A series of approximately twelve laboratory experiments designed for Mechanical

Engineering students to illustrate the strength of materials theory, the properties of engineering materials, and the methods for their testing.

Prerequisite: With or following ME 314.

ME 315—*Strength of Materials*—(3-0-3). A continuation of ME 314 including statically indeterminate beams, theories of elastic failure, curved bars, strain-energy applications, combined stress analysis, and thick walled cylinders.

Prerequisite: ME 314

ME 316—*Mechanisms*—(2-3-3). A study of the operating principles of machine parts to determine displacement, velocity, and acceleration by analytical and graphical methods. Emphasis is placed upon linkages, gears, gear trains, cams, belts and pulleys, chain drives, variable speed drives and reciprocating mechanisms.

Prerequisite: ME 112

ME 320—*Thermodynamics*—(3-0-3). A course presenting the fundamental concepts of thermodynamics for the engineering majors. The course includes a study of the First Law of Thermodynamics, the General Energy Equation, properties of the common working substances, the Second Law of Thermodynamics, analysis of cycles and internal combustion engines.

Prerequisites: M 202 and P 202

ME 321—*Thermodynamics*—(3-0-3). A continuation of ME 320, this course includes a study of vapors, Mollier diagrams, vapor cycles, steam power plants, refrigeration and heat transfer.

Prerequisite: ME 320

ME 322—*Machine Design I*—(2-3-3). A course designed to give some advanced work in machine design but mainly empirical design involving journal and bearing installations, fits and tolerances, weldments, keys and couplings, simple stress analysis, screw fastenings, columns and power screws.

Prerequisite: ME 314

ME 419—*Tool Design*—(2-2-3). Lecture and laboratory work for the purpose of providing Mechanical Engineering students with a survey of the Tool Design Field. Detailed discussions of the principles and practices of tool design are carried on in lectures; their practical applications being carried out during the laboratory sessions.

Prerequisite: ME 112

ME 420—*Industrial Engineering*—(2-2-3). Modern mass production methods present the major problem of the essential coordination between plant layout, material handling, methods engineering and production planning and control. Designed to teach a practicable method in which the coordination of these important factors can satisfactorily be solved.

Prerequisite: Senior standing.

ME 421—*Machine Design II*—(2-3-3). Theory and problems involving both analysis and design of machine parts used in the construction of modern machines. Some of the topics studied are: variable stresses, combined stresses, shaft, journal and plane surface bearings, ball and roller bearings, lubrication, flat belts and pulleys, V-belts and flexible connectors.

Prerequisite: ME 322

ME 422—*Machine Design III*—(2-3-3). A continuation of ME 421. Lectures, computation and laboratory covering such topics as gearing, brakes and clutches, springs and further application of the fundamental engineering principles to analysis and design.

Prerequisite: ME 421

ME 424—*Vibrations*—(3-0-3). The basic theory of mechanical vibrations. Such topics as, simple harmonic motion, single degree of freedom systems with and without damping, forced vibrations without damping, forced damped vibrations, torsion vibrations, critical speed in shafting and dynamic balancing are among those studied.

Prerequisites: ME 310, M 307

ME 425—*Fluid Mechanics*—(3-0-3). Fluid statics, fluids subject to acceleration, ideal and viscous fluids, boundary layer, energy relationships of compressible and incompressible fluids, flow around immersed objects, lift and drag and applications in hydraulic machines are the topics discussed in this course.

Prerequisite: ME 310

ME 426—*Mechanical Engineering Laboratory*—(0-3-2). A laboratory course for senior Mechanical Engineering students. Experiments in the field of heat power, fluid mechanics and mechanical properties of engineering materials.

Prerequisite: Senior standing.

DEPARTMENT OF PHYSICS

P 102—*Engineering Physics I*—(3-2-4). High school physics desired but not required. A study of Mechanics dealing with kinetics, statics, elasticity, hydrostatics, hydrodynamics and mechanics of gases. Laboratory consists of measurements in relation to above topics.

Prerequisite: M 101

P 201—*Engineering Physics II*—(3-2-4). A course study in Electricity and Magnetism dealing with the fundamental laws of electrical and magnetic fields, electrostatic fields, potential, steady currents, induced emf's, inductance, dielectrics, capacitance, and elementary transients. Laboratory consists of measurements in relation to above topics.

Prerequisite: P 102

P 202—*Engineering Physics III*—(3-2-4). A study of Heat dealing with temperature, calorimetry, change of state, heat transfer, thermal properties of matter, elementary thermodynamics. Such topics as wave motion, vibrating bodies, acoustical phenomena, geometrical optics, reflection, refraction, mirrors and lenses are also considered. Laboratory consists of measurements in relation to above topics.

Prerequisite: P 201

P 211—*College Physics I*—(3-2-4). This course is designed for students not majoring in engineering. The general subjects to be covered in the first semester are mechanics and heat. Demonstration of physical principles are incorporated into lecture periods and the laboratory schedule follows closely the material covered in the lectures.

Prerequisite: One year of secondary algebra and geometry

P 212—*College Physics II*—(3-2-4). This course follows the same general development and laboratory program as P 211. The subjects covered in this course are sound, light and electricity and magnetism.

Prerequisite: P 211

P 301—*Modern Physics*—(3-0-3). An introduction to modern physics including atomic and nuclear physics, spectroscopy, photoelectric phenomenon, solid state physics, wave mechanisms and X-ray crystallography.

Prerequisite: P 202

DEPARTMENT OF SOCIAL SCIENCES

SS 110—*General Psychology*—(2-0-2). An introductory course to assist the student in developing an understanding of the fundamental principles of psychology and their application. Among the topics to be included are: growth and development, motivation, learning, emotion and feeling, attention and perception, intelligence, thinking, personality and human adjustment.

SS 120—*Government*—(2-0-2). The aim of this course is to make the student realize that political and governmental processes are a living reality. Continuous attention to the human element and the phase of working politics will bring to the students a more personal acquaintance with our national government. Stress will be placed upon the growth of our federal government, the legislative, judicial and executive branches under the Constitution.

SS 121—*History of Western Civilization I*—(3-0-3). This course introduces the student to the main stream of our Western cultural heritage. It traces the history of man from earliest times to the Age of Louis XIV. While political history serves as a framework, emphasis is placed on the social, intellectual and economic factors of our past.

SS 122—*History of Western Civilization II*—(3-0-3). This course continues the History of Western Europe from 1715 to the present. Emphasis is again placed on the political, social, intellectual and economic factors which contributed to the development of our Western European cultural heritage.

SS 131—*Economic History of the United States*—(3-0-3). A study of the major developments in the American economy from the Colonial Period to the present time. The course treats of the influence of the frontier, the influx of immigrants, the growth of technological knowledge, the evolution of business organizations, government regulation and control, the growth of the machine process and of business enterprise.

SS 132—*Economic Geography*—(3-0-3). The course presents the regional distribution of the world's resources, industries and population. It studies the distribution and importance of manufacturing, mining, forestry, agriculture, and trade in relation to the factors of power resources, raw materials, climate, landforms, centers of population and world trade markets. This course provides an essential background for understanding industrial and commercial opportunities and limitations in various areas of the world.

SS 230—*Principles of Economics*—(3-0-3). This course is designed to meet the need for a general understanding of economic principles and their application in everyday life. Topics to be included are: evolution of U. S. economic system, organization of production, national income, analysis of production, the money and credit systems of exchange, international trade, organized markets and comparative economic systems.

SS 231—*Economic Analysis and Problems*—(3-0-3). This course emphasizes the following: demand, supply, market price, competition, monopoly, wages, rents, interest, profits, business cycles, value of money and general price changes, consumption, saving, investment and financing government.

Prerequisite: SS 230

SS 332—*History of Economic Thought*—(3-0-3). A survey of the economic thought and ideas of economists from ancient times to the present including: Malthus, Adam Smith, Ricardo, Mill, Marx, Henry George, Veblen, Keynes and Marshall.

Prerequisite: SS 230

SS 340—*Sociology*—(2-0-2). The aim of this course is to aid the student in developing an understanding of principles of sociology.

Topics to be covered in the course include factors in the social life of man, the role of culture, heredity and personality disorganization,

group life, suggestibility, status, cooperation, competition, conflict, population distribution and growth, communities, social institutions and social change.

Special attention will be given to some of the current social problems.

Prerequisite: SS 110, Junior standing.

SS 411—*Industrial Psychology*—(3-0-3). A study of the principles of psychology as applied to industry and business. Topics to be included are: individual differences and their nature, job satisfaction, industrial morale, incentives, job analysis, leadership and supervision, industrial conflict, measurement of attitudes in industry, fatigue, accidents, the maladjusted worker and the Hawthorne studies.

Prerequisite: SS 110, Senior standing.

SS 412—*Applied Psychology*—(3-0-3). A study of the application of the findings of psychologists to the problems of life and work. Among the topics included in the course are: the dynamics of behavior, frustration and conflict, child psychology, neurotic adjustments, psychotic adjustment, mental hygiene, supervision, morale, courtship and marriage, salesmanship, advertising, communication, crime and delinquency and psychotherapy.

Special attention will be given to the applications of psychology to the problems of business and industry.

Prerequisite: SS 110, Senior standing.

SS 413—*Psychology of Adjustment*—(3-0-3). A study of the dynamics of adjustment. Topics to be included are: primary and secondary needs, frustration, conflict, adjustive and non-adjustive reactions, the neurotic adjustment, the psychotic adjustment, the nature of psychotherapy and a positive approach to mental health.

Prerequisite: SS 110

SS 414—*Social Psychology*—(3-0-3). A study of the influences of social conditions on the psychological processes. Topics to be included are: role and status, social class, leadership, social frustration, effects of group situations, prejudice, public opinion, mass communication and propaganda and abnormal social situations.

Prerequisite: SS 110

SS 423—*History of American Civilization*—(3-0-3). This course traces the history of our unique American Civilization from its founding to the present time. Emphasis is placed on cultural developments in the United States; political and economic developments, however, are not ignored. Stress is placed on such diverse topics as our European heritage, foundations of the new nation division and integration (1820-1876), industrialization of American life and the triumph of democracy in America.

Prerequisites: SS 121, SS 122

SS 450—*Labor Relations*—(3-0-3). An analysis of the American labor movement emphasizing the development of unionism, union collective bargaining policies and practices, labor legislation and the economic aspects of some major problems of labor.

Prerequisite: SS 230, Junior standing.

DEPARTMENT OF TEXTILES

Division of Textile Design and Fashion

TD 101, 102—*Nature Drawing*—(3-2). A beginning study in the structures, patterns and colors found in nature. The student draws and paints actual specimens, studying the forms and textures in detail. The advanced course continues with more detailed study. The student is made aware of the vast inspirational material to be found in plants and other natural objects.

TD 103, 104—*Life Drawing*—(3-2). The study of the human figure, its mass, form, and proportions with emphasis in the first year on action drawing. Course in Anatomy No. 70-111 assists the student in learning about the human form.

TD 105, 106, 204, 205—*Drawing and Painting*—(3-1). This course enables the student to discover the capacity of color and pigment and other media; to symbolize sensory images of sight and touch and to show the relationship of these symbols to the requirements of the picture plane and the pictorial composition; also the use of representational devices to the various conceptions of expression.

TD 107, 108—*Design*—(8-4). Problems in two and three dimensional design involving color, line, form, texture and spatial relationships, give the student a basic knowledge for future courses in further design.

TD 111, 112—*Anatomy*—(1-1). A study of the bones of the skeleton, the muscles, and complete construction of the human figure. This is the basis of life drawing, fashion illustration and fashion design.

TD 113—*Lettering*—(2-1). This course begins with a study of the fundamentals of lettering, and continues with more advanced work in layout and lettering problems.

TD 114, 115, 206—*History of Art*—(2-2). This course is coupled with art appreciation to give the student a broader understanding of, and a sensitivity for, cultures of the past, the present and the future. The design of artifacts from other cultures is also of importance to the design student. Frequent visits to museums of art are included in the course.

TD 116—*Projection Drawing*—(2-1). Since drawing is a graphic language that is universally used by engineers, designers and illustrators to describe a size, a shape, or the layout of an object, this course has

been developed to provide a basic understanding of the methods used to prepare such drawings.

TD 201—*Nature Drawing*—(3-2). Rendering in watercolor, tempera and scratchboard.

TD 202, 203—*Life Drawing*—(3-2). An advanced drawing class often using a fashion model for illustration classes as well as a life model. Life drawings are sustained studies and modeled figure drawings.

TD 208, 209—*Textile Design*—(4-3), (8-6). This course begins with practice in rendering techniques to study the elements involved in designing printed and woven materials. Experiments in color and pattern and printing processes acquaint the student with the fundamentals of designing fabrics.

TD 210, 312, 313, 405, 406—*Fashion Illustration*—(2-1)*, (3-2)†, (4-3)‡. Fashion illustration concerns the setting up of the fashion figure, development of rendering and techniques for reproduction purposes. Drawing from live models serves as a discipline for observing details and fall of fabric on the human figure. The study of layouts and advertising necessary to fashion artist and field trips to engravers and newspapers complete the background of the student.

TD 301, 302—*Textile Design*—(8-6). Theoretical problems in fabric design and printing are keyed to industrial production for a variety of uses. Students develop original designs and learn to carry them to completion as printed goods by using the silk screen process.

TD 308, 309, 403, 404—*Handloom Weaving*—(4-2)†, (2-1)‡. This course gives the student the opportunity to learn the basic principles of hand weaving, and to experiment with colors and textures suitable for application to the power loom. He is encouraged to design directly on the loom, and to use the available materials to the best advantage.

TD 310, 311, 407, 408—*Apparel Design*—(4-3). The technique of draping and designing muslin models and the construction and use of the basic pattern is followed by advanced methods of pattern drafting. Original ideas are conceived in drafting and draping classes where garments are cut and completed.

TD 315, 316—*History of Costume*—(2-2). A survey of clothing development from earliest times to the present day. The utilization of source material from libraries, museums, etc., and the application of ideas from this source material contribute to original designs.

TD 320, 321, 420, 421—*Graphic Arts*—(3-2)†, (4-3)‡. The student is taught the methods of establishing communication, among those

* Sophomore year.

† Junior year.

‡ Senior year.

who produce, those who market and those who purchase goods, through newspaper, magazine, television, brochure and other forms of visual communication. This course also covers problems in the preparation of work for reproduction and production methods such as typesetting, engraving, printing and binding. Class work is supplemented by field trips.

Prerequisite: Junior standing

TD 401, 402—*Textile Design*—(6-4), (8-6). More advanced problems in designing, and experiments in production techniques using the silk screen process are encountered during the last year. In the final semester individual problems are carried out, and a portfolio is compiled before graduation.

TD 409—*Degree Project*—(6-3). During the second semester of the senior year each student selects a specific part of the textile design and fashion field in which he will complete a required amount of creative work and research. This project is submitted for approval before graduation.

Division of Textile Engineering

TE 100—*Introductory Textiles*—(2-0-2). A course designed for the purpose of indoctrinating Freshmen of the Textile Technology course in the non-technical phases of the textile industry. It gives the student an elementary understanding of the origin, types and uses of textile fibers. The course also provides a general discussion on the machinery involved in processing these fibers into yarn and fabrics. The theory and application of the yarn numbering systems are also discussed.

TE 101—*Introductory Survey of Textiles*—(1-0-1). An introductory course designed to familiarize the student of the Textile Design and Fashion and Textile Chemistry courses with the elementary and non-technical phases of the textile industry. A study is made of the definitions of the common terms used in manufacturing and finishing of textiles. The properties and characteristics of the natural and man-made fibers as well as the use of flow-charts for processing these fibers into a finished product are also reviewed.

TE 102—*Fabric Classification*—(1-1). A course relating to the characteristics, performance, properties and uses of a wide range of staple fabrics. Special emphasis placed upon the manner of producing various textures in woven fabrics, incorporating both natural and man-made fiber content.

TE 103—*Fiber Technology*—(1-0-1). An illustrated lecture course on the basic and outstanding microscopic characteristics and physical properties of the various textile fibers. Microphotographic slides of all fibers discussed are used as illustrations; technical data is presented and

discussed. The fibers included represent selected specimens of the natural vegetable fibers, the natural animal fibers, the regenerated rayons, the protons, the synthons, and the mineral fibers.

TE 200, 201—*Yarn Technology*—(2-2-3). The earlier lectures and laboratory periods of this course are devoted to the history, development, classification, ginning and marketing of cotton. Following this brief introduction, the lectures are devoted to the theory of processing, both natural and man-made fibers into drawing sliver; this is coupled with the mechanics and applications of the machinery involved. Special emphasis is placed on opening, cleaning, blending, doubling, evening and drafting. All speed and production calculations that are associated with the mechanisms are also considered.

TE 202, 203—*Fabric Technology*—(2-2-3). A detailed study of the construction, mechanical operation and theories underlying the processing of yarns into woven fabrics on cam, dobby and box looms. Preparation of yarns for weaving, including winding, creeling, slashing, beaming, drawing-in, tying-in and filling preparation. Students learn the methods and use of calculating such problems as production, picks per inch, cost and speeds. Laboratory periods familiarize the student with the operation, timing and fixing of the looms studied.

TE 204, 205—*Fabric Design and Structure*—(2-2-3). The purpose of this course is twofold: to instruct the student on the technology of weave formation, and simultaneously, to instruct the student on analyzing and reproducing fabrics. In the technology of weave formation, the student studies the basic weaves and their derivatives. Such weaves as the twill, sateen and cord are among those considered. The student is also taught the methods employed in determining the structure of the simpler fabrics and how these fabrics may be reproduced. These methods include determining overall and ground construction, yarn counts, fabric weight, drawing-in drafts, chain drafts, reed plan and color arrangement.

TE 206, 207—*Elements of Textile Manufacturing*—(4-3). A survey program to give the students of the Textile Design and Fashion curriculum an understanding of the methods employed in the processing of raw materials into yarn and fabrics. Laboratory periods are used to supplement class lectures by the demonstration of the equipment involved.

TE 208, 209—*Fabric Design and Structure*—(4-3). A course similar to TE 204, 205 and tailored to the needs of students taking the Textile Design and Fashion curriculum. Students are concerned only with the developing of the more common weaves as well as to the analyzing and reproduction of the simpler fabrics. The designing of jacquard materials is given special emphasis.

TE 210, 211—*Fabric Classification*—(1-0-1). A study of the characteristics of a wide range of staple fabrics made of cotton, wool, rayon,

silk, nylon, orlon, azlon, glass and other fibers. The student is supplied with samples of the various materials together with the information pertaining to their characteristics such as construction, composition, weave, performance and uses. At the conclusion of the course, the student has a notebook containing about 300 samples of staple cloths and the data applying to each sample.

TE 300, 301—*Yarn Technology*—(2-2-3). A continuation of TE 200, 201 on the mechanics, theories and applications involved with the use of combing, roving, spinning and twisting equipment in the processing of drawing sliver into spun yarn. The drafting systems, twist, winding, timing and setting, and speed and production calculations are among the topics considered.

Prerequisite: TE 201

TE 302, 303—*Fabric Technology*—(2-2-3). A continuation of TE 202, 203 through Jacquard weaving, covering a study of the more complex loom mechanisms and their relation to the production of various types of fabrics. Practical work is devoted to the operation of these looms and to the timing and fixing of the newer mechanisms discussed. A project involving the preparation and weaving of an "original" fabric design on a dobby loom is considered an important function of the laboratory work.

Prerequisite: TE 203

TE 304, 305—*Fabric Design and Structure*—(2-2-3). A continuation of the Fabric Design and Structure course given the previous year. The study of the technology of weaves includes double cloths, leno and jacquard constructions. Students are given more advanced fabrics to analyze for the determination of the data necessary in their reproduction as well as the methods employed in the development of fabrics with technical specifications.

Prerequisite: TE 205

TE 306—*Physical Testing*—(1-2-2). This course is especially designed for students taking the Textile Chemistry curriculum. It is similar to TE 400 in that it trains the student in the techniques and instruments used for the determination of fiber, yarn and fabric properties. Instruction on the microscopic characteristics and physical properties of the various textile fibers was introduced in the Freshman year and is, therefore, not considered in this course. The theories underlying the determined properties of only the yarns and fabrics as well as the statistical analysis and interpretation of the data obtained are considered an important function of the course.

TE 307—*Microscopy*—(1-2-2). This course is similar to TE 401 but with less emphasis on the microscopic characteristics of the various fibers which were previously considered in the Freshman year.

TE 308—*Color*—(1-0-1). A study of the theory and facts of color so that the student taking the Textile Chemistry course can understand the use of the performance of colors when applied to fabrics. The course includes hue, value and chroma scales, complementary colors, harmony and color effects.

TE 309—*Stitching and Knitting*—(2-1). A study of the functions of the garment industry with relation to pattern and standards, cutting and assembling of all classes of garments; the study and use of power sewing machines found in the industry today. The knitting phase of this course covers the designing of the major classes of hosiery, sweaters and undergarments as well as the demonstration of knitting machines.

TE 310—*Materials and Fabrics*—(3-0-3). A course comprised of an initial study of natural and man-made fibers, including their properties and methods of constructing into yarn and fabrics. Continued study involves terminology, fabric characteristics, performance, and care as pertaining to selection of textile materials for specific apparel and household uses. Extensive distribution of fabric specimens supplements the course content and supplies the student with a reference file.

TE 311, 312—*Knitting Technology*—(2-4-4). A study of the important types, theories and applications of flat bed and circular knitting machines. Considerable stress is placed on the various yarns, needles, stitches and characteristics of the fabrics produced from each.

TE 313, 314—*Knitting Design and Structure*—(2-2-3). A study of the design, reproduction and analysis of knitted fabrics. The lectures and laboratory work also teaches the student to recognize any type of fabric, its stitch construction and possible methods of manufacture. Students produce original designs from pattern drum, pattern wheel, etc.

TE 400—*Physical Testing*—(2-2-3). A course designed to train students in the techniques and instruments used for the determination of the fiber, yarn and fabric properties studied. Special emphasis is placed on the theories underlying the determined properties as well as the interpretation of the data obtained.

TE 401—*Microscopy*—(1-3-2). A course designed to instruct the student in the use of an optical microscope; its value and limitations. The microscope is used in conjunction with fiber identification and structure; determination of blends, maturity, mercerization and the physical, chemical and biological damage to textiles. The use of the various types of micrometers in the measurement of length, diameter, area as well as the accurate and rapid counting of twist and number of filaments is also studied.

TE 402—*Mill Engineering*—(2-0-2). A study of the problems of mill organization, equipment, the layout of machinery and equipment costs.

Prerequisite: Senior standing.

TE 403—*Knitting Technology*—(2-1-2). A survey of the important types and applications of knitting machines. Special emphasis is placed on the various needles, stitches and the characteristics of the fabrics produced by each.

TE 404—*Quality Control*—(3-0-3). A study of industrial quality control by statistical methods as applied to manufacturing processes. The methods of data analysis, inspection methods, determination of sample size and the construction and use of control charts are studied.

Prerequisite: M 221

TE 405—*Fabric Testing*—(2-1). A course especially designed to meet the needs of the Textile Design and Fashion students. Special emphasis is placed on the techniques and instruments used in the determination of the fabric properties studied. The physical properties of fiber and yarns as related to fabric construction and appearance are also given consideration.

TE 406—*Knitting Technology*—(1-2-2). A study of the mechanics of all hosiery and half hosiery machines.

Prerequisite: TE 312

TE 407—*Knitting Technology*—(1-2-2). A study of the full-fashion industry. Looping, backseaming, pre-boarding, dyeing and boarding and testing of the products for size, flex and wear.

Prerequisite: TE 406

TE 408—*Knitting Research*—(1-2-2). Students produce on circular knitting machines a product which fulfills given specifications. The students then collect and interpret the data obtained in the testing of the product for the various characteristics required.

Prerequisite: Senior standing.

TE 413, 414—*Knitting Design and Structure*—(1-2-2). A continuation of TE 314 covering the design, reproduction and analysis of high pile, loop, narrow type classes and jacquard fabrics.

Prerequisite: TE 314

NEW BEDFORD INSTITUTE OF TECHNOLOGY

General Index

| | PAGE |
|--|------|
| Accounting, see Business Administration. | |
| Administrative Assignments | 6 |
| Administration, Offices of | 6 |
| Admission Requirements | |
| Evening School | 65 |
| Graduate School | 60 |
| Undergraduate School | 14 |
| Advisory Committee to Administration | 6 |
| Aims of the Institute | 10 |
| Alumni Association | 30 |
| Application Procedures | |
| Evening School | 65 |
| Graduate School | 60 |
| Undergraduate School | 14 |
| Athletics | 28 |
| Attendance | |
| Evening School | 66 |
| Undergraduate School | 18 |
| Board of Trustees | 5 |
| Bookstore | 20 |
| Buildings and Equipment | 12 |
| Business Administration | 33 |
| Majors | |
| Accounting | 33 |
| Management | 34 |
| Marketing | 34 |
| Program | 35 |
| Description of Courses | 68 |
| Calendar of Events | 3 |
| Academic Year, 1959-1960 | 3 |
| Academic Year, 1960-1961 | 4 |
| Camera Club | 26 |
| Chemistry | 39 |
| Chemistry | 39 |
| Program | 40 |

| | |
|--|----|
| Textile Chemistry | 39 |
| Program | 53 |
| Description of Courses | 70 |
| Circle K Club | 26 |
| College Glee Club | 26 |
| Conduct | 18 |
| Courses of Study | |
| Evening School | 66 |
| Graduate School | 62 |
| Non-Degree | 64 |
| Undergraduate School | 32 |
| Credits and Averages | |
| Graduate School | 61 |
| Undergraduate School | 19 |
| Dean's List | 19 |
| Degrees with Distinction | 19 |
| Description of Courses | 67 |
| Business Administration | 68 |
| Chemistry | 70 |
| Electrical Engineering | 76 |
| English and Modern Languages | 80 |
| Mathematics | 81 |
| Mechanical Engineering | 83 |
| Physics | 86 |
| Social Sciences | 87 |
| Textiles | |
| Textile Design and Fashion | 90 |
| Textile Engineering | 92 |
| Directory of Personnel | 5 |
| Electrical Engineering, see Engineering. | |
| Eligibility | 19 |
| Endowments and Scholarships | 22 |
| Engineering | 42 |
| Electrical Engineering | 42 |
| Program | 44 |
| Description of Courses | 76 |
| Mechanical Engineering | 43 |
| Program | 47 |
| Description of Courses | 83 |
| Textile Engineering | 43 |
| Program | 49 |
| Description of Courses | 92 |
| English and Modern Languages, Description of Courses | 80 |
| Environment | 11 |

| | |
|---|----|
| Evening School | 65 |
| General Information | 65 |
| Courses of Study | 66 |
| Fabricator | 27 |
| Faculty | 7 |
| Fraternal Societies | 27 |
| Future Expansion | 13 |
| General Information | |
| Evening School | 65 |
| Graduate School | 60 |
| Undergraduate School | 10 |
| Grading and Degrees | 19 |
| Graduate School | 60 |
| General Information | 60 |
| Courses of Study | 62 |
| Graduation Requirements | |
| Graduate School | 61 |
| Undergraduate School | 20 |
| Guidance and Counseling | 21 |
| History of the Institute | 10 |
| Housing | 20 |
| Library | 20 |
| Lounges | 21 |
| Management, see Business Administration. | |
| Marketing, see Business Administration. | |
| Mathematics, Description of Courses | 81 |
| Mechanical Engineering, see Engineering. | |
| Non-Degree Courses of Study | 64 |
| Physics, Description of Courses | 86 |
| Placement | 21 |
| Professional Societies | 27 |
| Psychological Services | 21 |
| Public Relations, Office of | 29 |
| Refunds | 17 |
| Religious Groups | 28 |
| Research Foundation | 29 |
| Rooms, see Housing. | |

| | |
|---|----|
| Social Sciences, Description of Courses | 87 |
| Status of the Institute | 12 |
| Student Awards | 23 |
| Student Council | 28 |
| Student Facilities and Services | 20 |
| Student Organizations | 26 |
| Student Regulations | 18 |
| Tech Talk | 28 |
| Textiles | 51 |
| Textile Chemistry | |
| Graduate | 62 |
| Program | 62 |
| Non-Degree Course (Chemistry, Dyeing and Finishing) | 64 |
| Undergraduate | 51 |
| Program | 53 |
| Description of Courses | 70 |
| Textile Design and Fashion | 51 |
| Program | 55 |
| Description of Courses | 90 |
| Textile Engineering | 52 |
| Program | 49 |
| Description of Courses | 92 |
| Textile Manufacture, Non-Degree Course | 64 |
| Textile Technology | |
| Graduate | 63 |
| Program | 63 |
| Undergraduate | 52 |
| Program | 57 |
| Description of Courses | 92 |
| Tuition and Fees | |
| Evening School | 65 |
| Graduate School | 61 |
| Undergraduate School | 17 |
| Undergraduate Courses of Study | 32 |
| Withdrawals | 18 |

